

HAGERMAN FOSSIL BEDS National Monument • Idaho

General Management Plan

RECOMMENDED:

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September 18, 1996

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September 18, 1996

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September 18, 1996



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General Management Plan

September 1996

Hagerman Fossil Beds

National Monument • Idaho



More information about Hagerman Fossil Beds National Monument is available at the following address:

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Hagerman Fossil Beds National Monument protects the world's richest known fossil deposits from the late Pliocene time period. When it was established in 1988, the monument was also given a unique legislative mandate: to provide a center for continuing paleontological research and education.

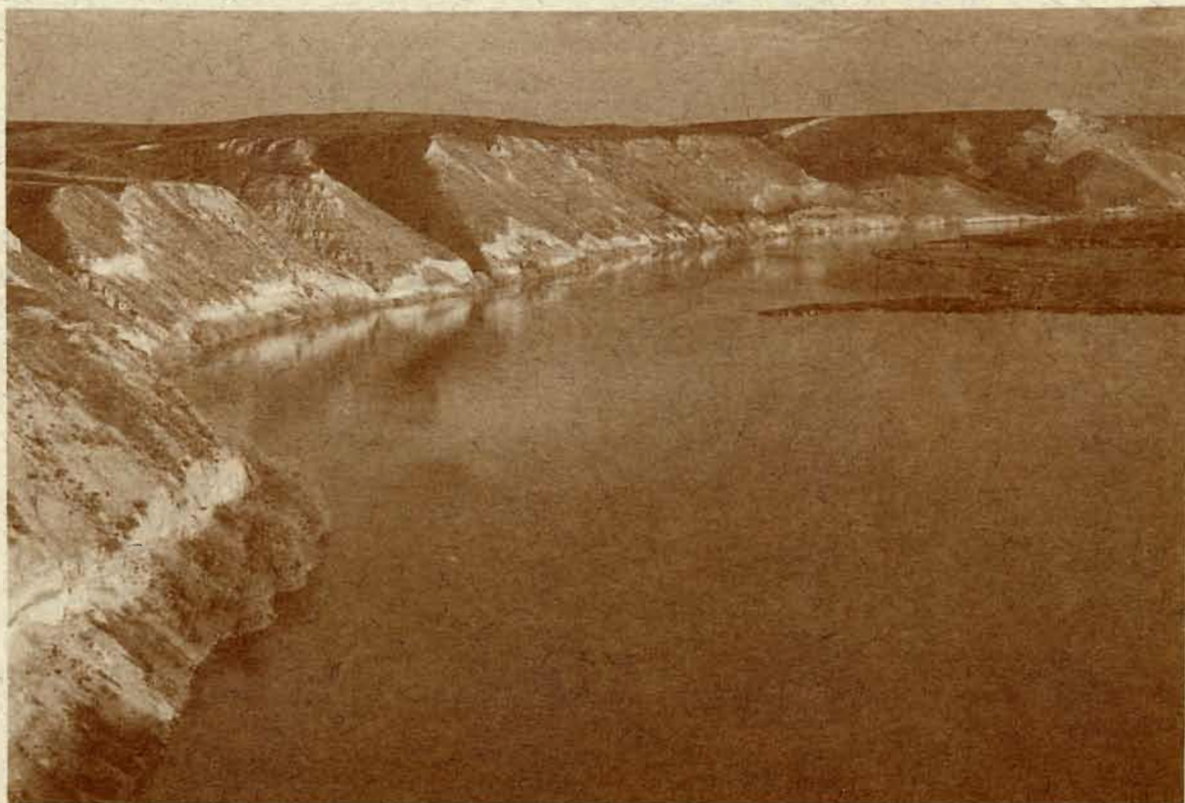
The diverse Hagerman fossil specimens represent the last vestiges of species that existed before the Ice Age and the earliest appearances of modern flora and fauna. The deposits are contained in continuous, uninterrupted geologic strata exposing 500,000 years of an intact paleoecosystem, including wetland, riparian, and grassland savanna habitats.

More than 550 fossil sites have been documented at different horizons within the sediments. The best known discovery is the Hagerman Horse, *Equus simplicidens*, now the official Idaho state fossil. The Hagerman Horse Quarry, a national natural landmark, is recognized as one of the most important sites in the world related to the fossil history of the horse. Also preserved are more than 200 species of vertebrates, invertebrates, and plants. The monument's high concentration of sites from a relatively short geological span of time makes possible the understanding of geological events, environmental changes, and biodiversity not possible for most fossil areas.

Perhaps the true scientific significance of the Hagerman fossils is yet to be defined. A recent discovery — in sediments 3 million years old — was a log that has never been fossilized. This is the only known recovery of organic wood in North America dating from the Tertiary period. Scientists will analyze this ancient log, including its cell structure and DNA, and use this information to compare its ecological organization with modern ecosystems.

Many other natural and cultural resources are preserved in the monument. Most significantly, it is one of only three units in the national park system that contain parts of the Oregon National Historic Trail.

This plan will fully protect these internationally significant resources and fulfill the mandate to provide a center for paleontological research and education. The focus of these efforts will be a research center and museum that will make it possible for visitors and students to experience hands-on interaction with the scientific discovery process. In addition, scientists at the monument will be able to expand our knowledge of the earth's history through that process.

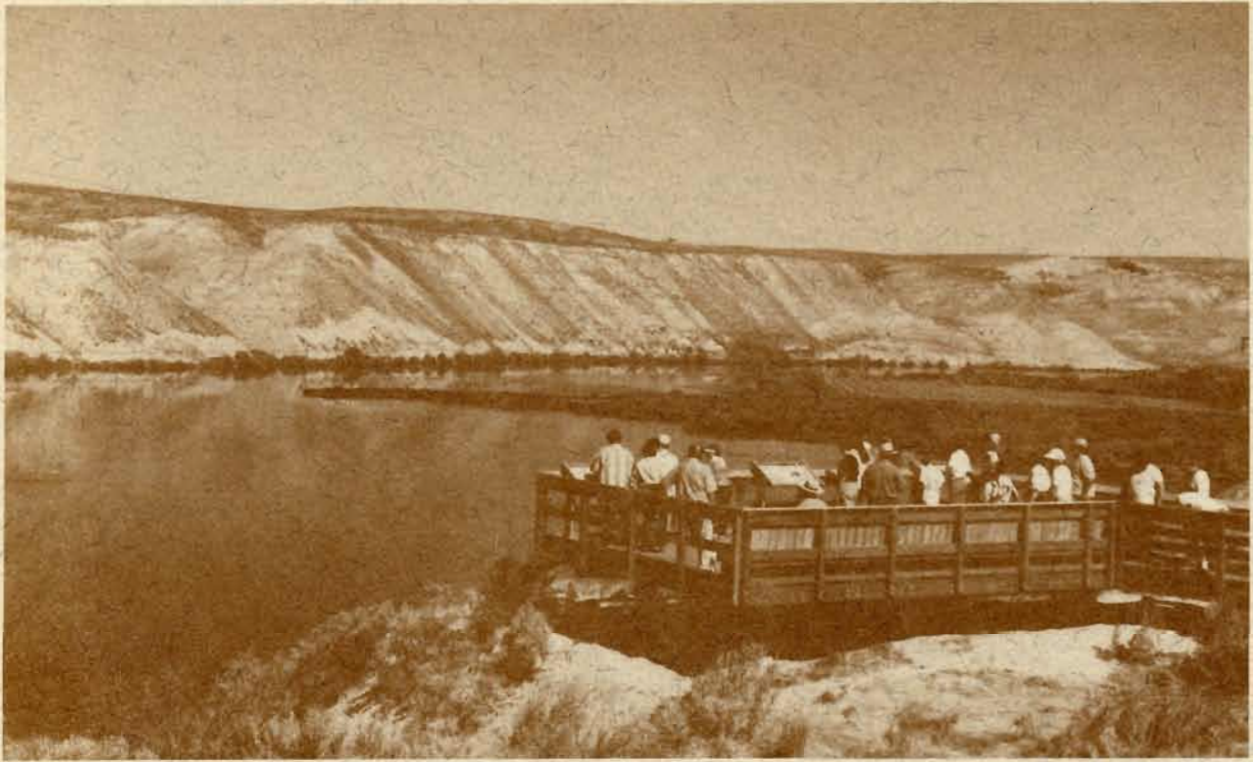


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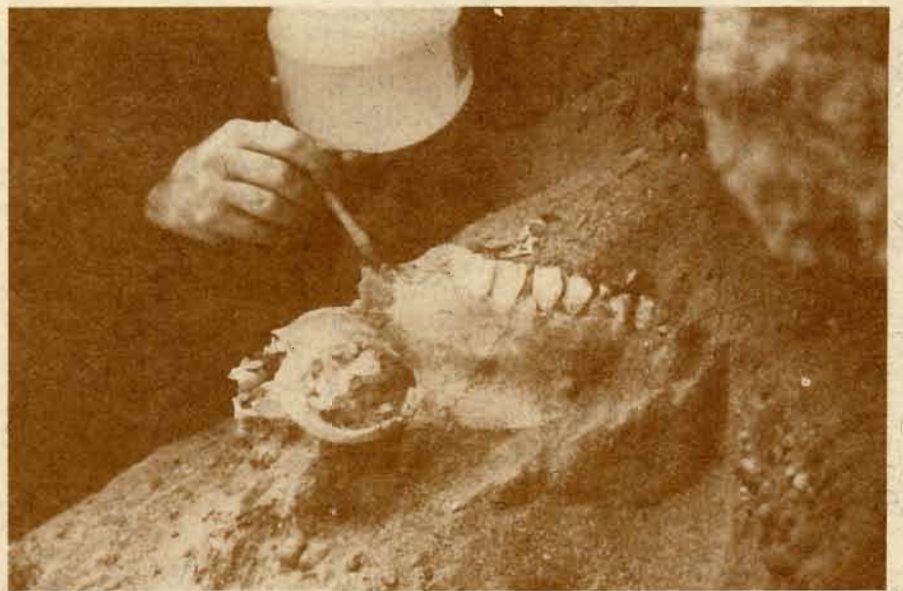
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Snake River Overlook



Camel skull excavation

INTRODUCTION

This plan presents a strategy for managing the resources, visitor use, development, and operation of Hagerman Fossil Beds National Monument according to the legislation that established the monument and the other laws, regulations, and policies that affect it. The plan states the monument's purpose, significance, management goals, and desired future conditions. It then describes management zones and the plan of action for managing the monument (see Vicinity map and Monument map).

The National Park Service (NPS) is required by Congress to develop a general management plan for each unit of the national park system (Public Law 95-625, section 604). General management plans guide the management of units of the national park system for 15 years or more. However, since this *General Management Plan* is the first for Hagerman Fossil Beds National Monument, it will also define and set the course for what the monument will be in the future.

This *General Management Plan* addresses issues regarding paleontological research and the management of the monument's paleontological and other cultural and natural resources. Also addressed are access and transportation, visitor use and experience, social and economic considerations, and facilities. The site for a research center and museum was selected in a previous planning effort and was incorporated into the plan.

The major components of the *General Management Plan* are as follows:

- ★ The *purpose and significance* of the monument.
- ★ The *management goals*, which serve to guide the National Park Service in making future management decisions.
- ★ The *desired future conditions*, which describe the overall conditions at the monument that will be achieved through successful accomplishment of the management goals.
- ★ The *plan of action*, which is a detailed description of the development strategies and specific management actions that have been decided upon to achieve the desired future conditions.

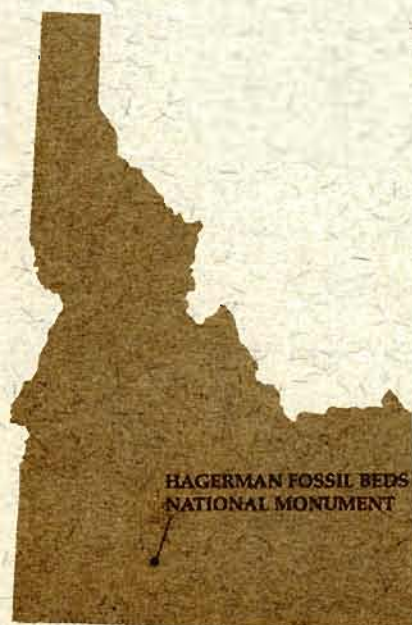
The implementation of this plan will fully meet the legislative mandate to provide a center for paleontological research and education. It includes a fully functional research center and museum, with the National Park Service performing research and educational functions as peers and full partners with organizations outside the National Park Service. NPS paleontologist(s) not only will supervise all activities regarding the monument's paleontological resources but will also perform many of the activities in conjunction with partners, including research, resource management, data management, specimen preparation, and curation functions. An institute will be established to provide affiliations with universities and other appropriate entities to provide academic credit, research grants, and other activities unavailable to the National Park Service.

The research center and museum will be integrated so that visitors can interact with researchers and research projects. Support for educational programs will be a major monument function. In

addition to paleontological resources, other monument resources, including the Oregon Trail, will receive the benefit of fully professional resource management, interpretation, and educational programs. An overlook at the Hagerman Horse Quarry and a Rim-to-River Trail will be constructed, along with improvements at the existing Snake River and Oregon Trail overlooks and the Bluff and Emigrant Trail.

Because this is a conceptual plan, site-specific designs have not been developed for implementation actions. In all cases, site-specific surveys, consultation, and compliance with all laws, regulations, and policies, including mitigation if necessary, will be carried out before any development begins.

The National Park Service intends to set up implementation teams and partnerships involving other persons, agencies, and organizations that will assist in implementing this plan. These other parties will help develop strategies for specific implementation proposals and actions. Creative and innovative opportunities to implement the plan and ways to take advantage of potential cost savings will be explored as a major part of our implementation efforts. The National Park Service intends to seek congressional appropriations only when absolutely necessary as a shared contribution to an overall partnership approach.

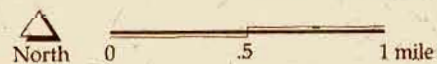
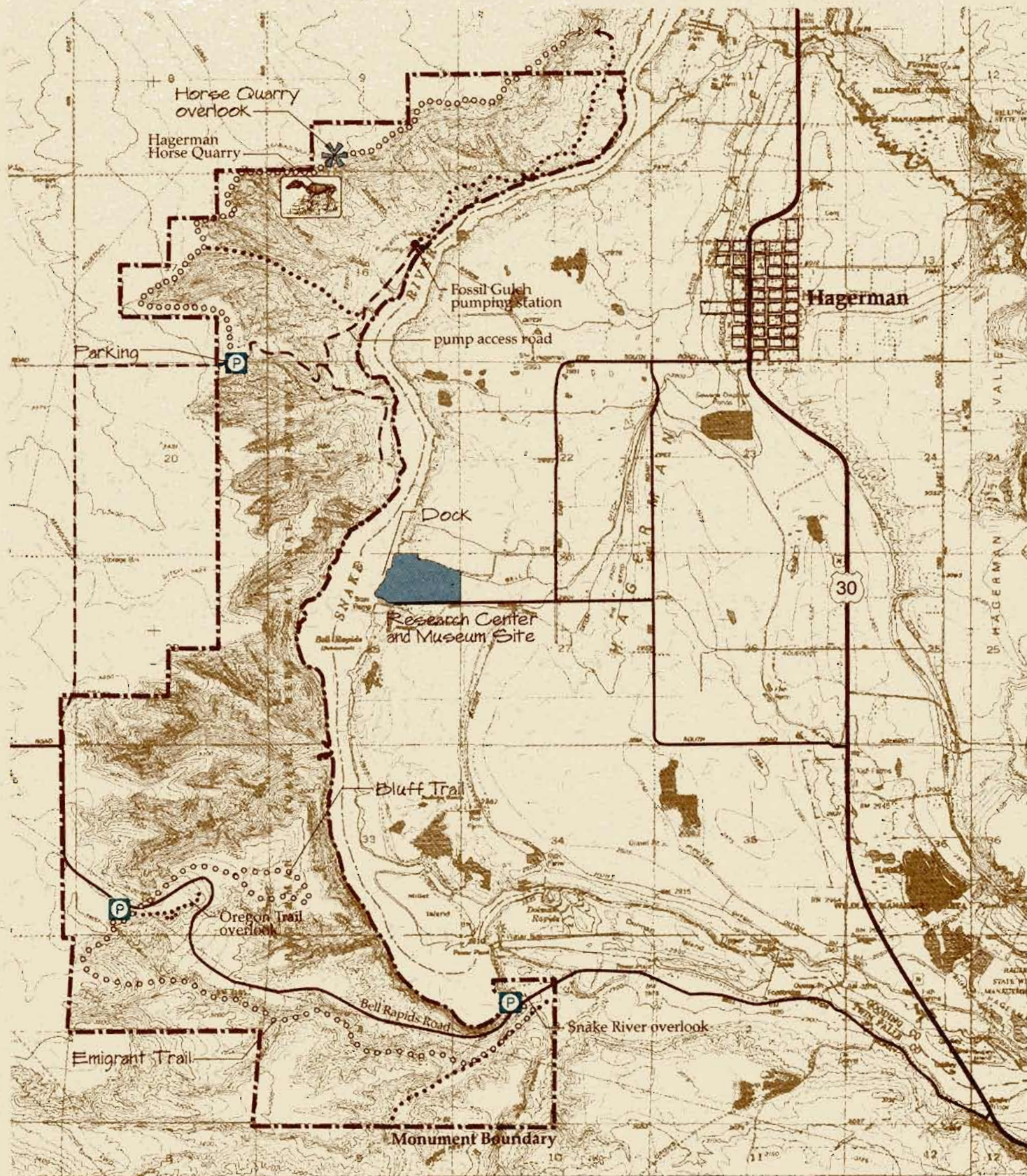


Vicinity

Hagerman Fossil Beds National Monument

U. S. Department of the Interior / National Park Service
300/20018A/DSC/Sept. 96





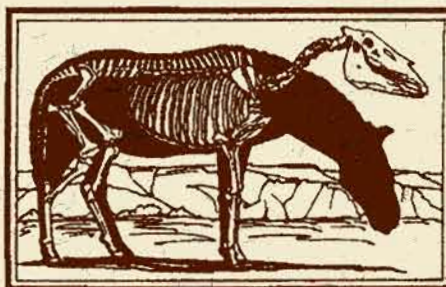
The Monument

Hagerman Fossil Beds National Monument

U. S. Department of the Interior / National Park Service
300/20025 / DSC / Sept. 96



- Existing trails
- Proposed trails (conceptual)
- - - - - Dirt roads
- Paved roads
- Parking



Monument Purpose and Goals



Artist rendition of Hagerman area during the Late Pliocene

MONUMENT PURPOSE

The purpose of Hagerman Fossil Beds National Monument is as follows:

Purpose statements express the reasons for which a unit of the national park system was established. They are used to define management priorities and are central to assumptions about how the monument should be used and managed.

- ◆ to preserve for the benefit and enjoyment of present and future generations the outstanding paleontological sites known as the Hagerman Valley fossil sites
- ◆ to provide a center for continuing paleontological research
- ◆ to provide for the display and interpretation of the scientific specimens uncovered at such sites
- ◆ to provide for the orderly and regulated use of and research in the monument by qualified scientists, scientific groups, and students under the jurisdiction of such qualified individuals and groups

These statements of purpose are derived from the monument's establishing legislation, title III of Public Law 100-696, dated November 18, 1988.

The monument is also part of the national park system, whose purpose is "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (16 USC 1). This and other laws applicable to all units of the national park system are applicable to Hagerman Fossil Beds National Monument and contribute to the purpose of the monument.

In addition to the monument's purpose, the following legislative direction for management of the monument was provided in Public Laws 100-696 and 101-512:

The Secretary is authorized to acquire lands or interests in lands within the monument only by donation or exchange.

Nothing in this title, nor any action taken pursuant thereto, shall constitute either an expressed or implied reservation of water or water rights for any purpose.

Nothing in this title shall affect electrical generating and transmission and irrigation pumping and transmission facilities in existence within the boundaries of the monument, or the right to operate, maintain, repair, upgrade, and modify such facilities. Such facilities are hereby expressly determined to be compatible and consistent with the purposes of this title.

... the Secretary shall hereafter permit hunting and fishing as well as maintenance of structures necessary to undertake such activities, including but not limited to duck and goose blinds on those lands within an area fifty feet in elevation above the high water level of the Snake River in accordance with otherwise applicable laws of the United States and the State of Idaho.

MONUMENT SIGNIFICANCE

Hagerman Fossil Beds National Monument is nationally and internationally significant for the following reasons:

- ◆ The monument contains world-class paleontological resources. This includes the world's richest (in terms of quality, quantity, and diversity) known deposits of fossils from the late Pliocene (Blancan) time period. Many of the monument's fossil specimens represent the last vestiges of species that existed before the Ice Age, or Pleistocene, and the earliest appearances of species of modern flora and fauna.
- ◆ The monument's paleontological resources are contained in a continuous, undisturbed stratigraphic record spanning at least 500,000 years. In addition, the monument's fossil deposits represent what appears to be an entire paleontological ecosystem with a variety of habitats such as wetland, riparian, and grassland savanna. The quantity and quality of information in the monument's sediments and fossils permit scientific analyses that allow comparisons with modern ecosystems and permit studies of environmental changes and biodiversity. In light of the monument's mandate to provide a center for paleontological research, its resources also afford opportunities to contribute new approaches (including applying ecological principles) and to adapt technologies from other fields to the science of paleontology.
- ◆ The monument contains the Hagerman Horse Quarry, a national natural landmark recognized as one of the six most important sites in the world regarding the fossil history of the horse (MacFadden 1992). The large number of high-quality specimens at the Hagerman Horse Quarry facilitate studies of the ecology and population structure of the earliest known representative of the modern horse genus *Equus*.
- ◆ The history of paleontological research at Hagerman Fossil Beds in many ways parallels the history of the science of paleontology, providing opportunities for education and interpretation about the science as well as the resource.
- ◆ The monument is one of one of only three units in the national park system that contain parts of the Oregon National Historic Trail.
- ◆ The monument contains cultural resources potentially eligible for inclusion on the National Register of Historic Places, and it has cultural significance to American Indians.
- ◆ The monument contains evidence of many aspects of the geologic history of southern Idaho, including cycles of sedimentation and erosion; the history of ancient Lake Idaho, which is linked to long-term climatic change; the cataclysmic and geologically instantaneous Bonneville Flood; and basalt flows that affected the course of the Snake River, which borders the monument.

The following significant resources also are found in Hagerman Fossil Beds National Monument:

- ◆ natural quiet, which predominates in many places in the monument

- ♦ habitat for sensitive plant and animal species and portions of several natural ecosystems, including important waterfowl habitat along the Snake River
- ♦ one of the primary public federal access points in south-central Idaho to the Snake River and its significant hunting, fishing, and recreational resources
- ♦ important opportunities to interpret local and regional history

MANAGEMENT GOALS

Consistent with the monument's purpose and applicable laws and policies, Hagerman Fossil Beds National Monument will be managed for the benefit and enjoyment of present and future generations to accomplish the following goals:

Management goals are broad statements of the ends to be achieved in accomplishing the legislative purpose of a national park or monument. These goals are influenced by the monument's significance, the known planning constraints, and the necessary actions to manage and protect the resources for the public's long-term use and enjoyment.

- ♦ Preserve and protect the paleontological resources of the Hagerman Valley fossil sites, including both specimens and their context.
- ♦ Provide a center for continuing paleontological research, education, and interpretation.
- ♦ Encourage and support scientific research and related activities associated with monument resources and the science of paleontology.
- ♦ Achieve appropriate accreditation for monument facilities and programs.
- ♦ Provide a range of opportunities for visitors to experience and understand the present and past environmental interrelationships, resources, and values of the monument.
- ♦ Preserve, protect, and interpret the natural and cultural resources associated with the monument.
- ♦ Provide for the health and welfare of monument visitors, researchers, and staff.
- ♦ Cooperatively manage hunting and fishing in the monument to ensure the continuance of this historic use as legislatively required, while protecting monument resources, values, public safety, research, and other authorized activities.
- ♦ Cooperate with the operation, maintenance, repair, upgrade, and modification of existing electrical and irrigation facilities within the boundaries of the monument as legislatively required while minimizing any adverse impacts of these activities on monument resources, values, research, or visitors.
- ♦ Consistent with the above, strive to be a good neighbor and an asset to the long-term welfare of the Hagerman Valley region. Maintain effective relations with local communities, state and federal agencies, and tribal governments.

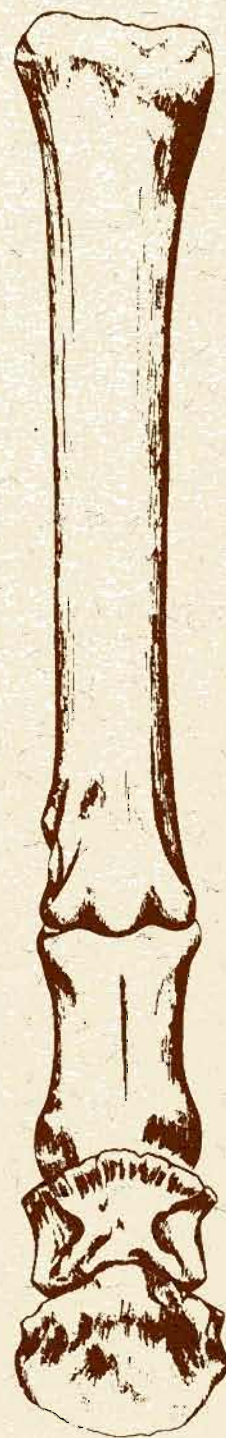
DESIRED FUTURE CONDITIONS

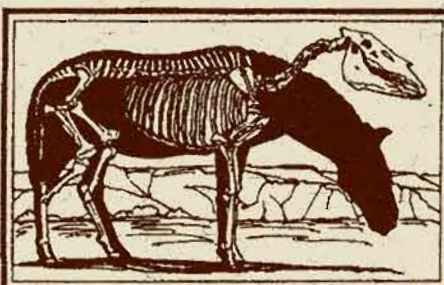
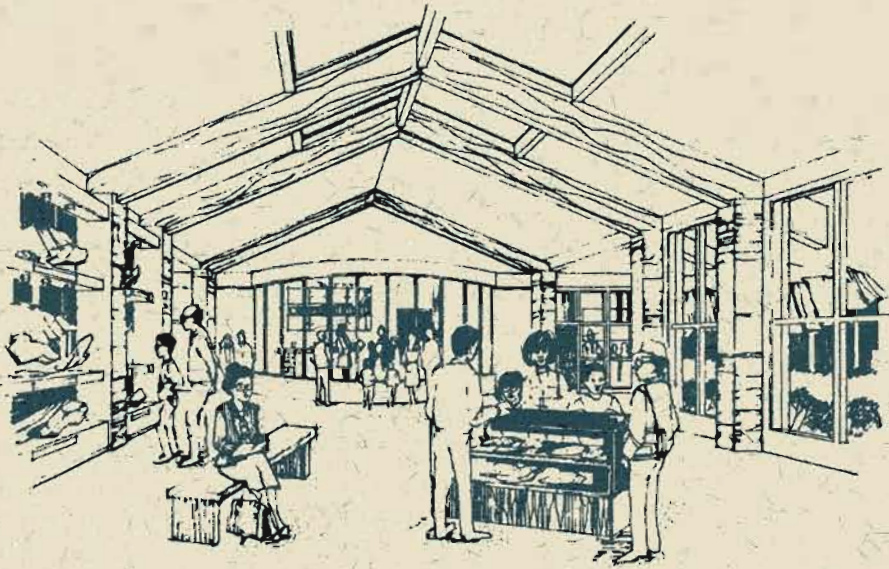
The criteria used for developing statements of the conditions desired for the future of Hagerman Fossil Beds National Monument were as follows: (a) they must be ends rather than means, and (b) they must follow from the statements of monument purpose, significance, and management goals. The conditions listed below are desired for the year 2010, with hoped-for relevance far into the future.

- ◆ Active paleontological research and resource management will be conducted at the monument. The National Park Service will supervise all activities and will have the capability to conduct most aspects of these activities at some level. The National Park Service also will actively and aggressively encourage partnerships and outside assistance and advice in the design and conduct of paleontological research and resource management and educational or interpretive activities.
- ◆ The monument's research center and museum will be recognized by the scientific community as a leader in the field, with appropriate accreditation and peer status. The National Park Service will provide the paleontological resources, support facilities, and a certain amount of staff and funding, but these will be augmented by outside facilities, staff, and funding. There will be broad-based internal and external support for the monument's research and resource management programs in terms of funding, staffing, equipment, and facilities.
- ◆ The monument will be a recognized leader in the field of paleontological resource management and will network effectively with other fossil sites and research facilities.
- ◆ The results of monument research efforts will be published in scientific journals and popular media.
- ◆ The monument's natural and cultural resources and values will be protected.
- ◆ Fossil specimens surfacing through natural processes or research activities will be properly collected, documented, prepared, and curated. Very rarely, specimens will surface because of uncontrolled or unauthorized human activities such as irrigation, landslides, off-road vehicles, trails, or unauthorized collecting. Visitors will understand proper behavior regarding paleontological resources.
- ◆ A significant portion of the monument's paleontological resources will be left protected in the ground for the benefit of future generations of researchers with improved techniques and tools.
- ◆ The causes of occurrences threatening monument resources, such as landslides, will be determined and mitigated whenever possible.

Statements of desired future conditions are more detailed than statements of goals. They delineate the conditions that would be achieved by accomplishing the goals. The management plan described in this document is the means by which the goals and the desired future conditions will be attained.

- ◆ Land uses surrounding the monument and along access roads to the research center and museum will be compatible with and contribute to visits to the monument.
- ◆ Research will be recognized by visitors as a process, not a place or an object. The significance of monument research will be interpreted and understood by lay persons. Visitors will appreciate that paleontology is an important part of their heritage.
- ◆ Educational opportunities will be provided for students at all grade levels.
- ◆ Visitors will feel they have benefited from their visit to the monument.
- ◆ Visitors will leave the monument with an understanding of the interpretive themes.
- ◆ Access to the research center and museum will be easy for visitors.
- ◆ Visitors will have controlled access to research and resource management activities and results.
- ◆ The monument will be considered a desired destination rather than a side trip.
- ◆ Visitor health and welfare will be adequately protected.
- ◆ Access and facilities will be adequate and appropriate for each destination in the monument.
- ◆ The monument will be recognized as an asset to the community and the region.
- ◆ The *General Management Plan* will be fully implemented. Action plans called for by the plan will be completed and implemented.
- ◆ The National Park Service and the private sector will work together to protect monument resources while allowing electrical and irrigation facilities to function as intended.
- ◆ The National Park Service will contribute to and participate in professional, well-integrated regional planning and regional coordination of recreational opportunities and information. This will include being an active partner in interagency recreation and tourism plans.
- ◆ Ongoing working relationships will be maintained with interested Native Americans.





The Plan of Action

MICHIGAN ACADEMICIAN

PAPERS OF THE MICHIGAN ACADEMY OF SCIENCE, ARTS, AND LETTERS
Vol. 1 No. 1 Winter 1969

CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY
THE UNIVERSITY OF MICHIGAN

Vol. 23, No. 1, p. 1-36 (13 text-figs.)

November 28, 1969

THE RODENTS FROM THE HAGERMAN LOCAL FAUNA, UPPER PLOCIENE OF IDAHO

CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY
THE UNIVERSITY OF MICHIGAN

Vol. 23, No. 2, p. 171-190 (18 text-figs.)

February 12, 1971

THE INSECTIVORES OF THE HAGERMAN LOCAL FAUNA, UPPER PLOCIENE OF IDAHO

NEW FIDELIA FROM THE UPPER PLOCIENE OF IDAHO

By C. Lewis Gares

During a study of the light-colored fossils from the Pliocene Quarry at Hagerman, Idaho, I have found in the Hagerman collection some of the quarry and have been able to identify a variety of interesting insectivorous types. Particularly noteworthy are the remains of new species. The material consists of 100 teeth and 100 fragments representing two distinct forms, a small and a large one.

For the purpose of this study, the University of Michigan, through the kindness of Dr. Charles S. Smith, has received material obtained by the field parties in the Hagerman area in the Pliocene (Hagerman local fauna).

The material consists of 100 teeth and 100 fragments representing two distinct forms, a small and a large one.

A part of the material is from the Hagerman Quarry, and the rest is from the Hagerman local fauna.

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TRANSACTIONS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY

HELD AT PHILADELPHIA
FOR PROMOTING USEFUL KNOWLEDGE

NEW SERIES—VOLUME 60, PART 7
1970

THE CARNIVORA OF THE HAGERMAN LOCAL FAUNA (LATE PLOCIENE) OF SOUTHWESTERN IDAHO

JOURNAL
OF THE

WASHINGTON ACADEMY OF SCIENCES

Vol. 28

February 15, 1938

No. 2

PALEONTOLOGY.—*Fossil peccary remains from the upper Pliocene of Idaho.* C. LEWIS GARES, U. S. National Museum.

In 1934 the Smithsonian Institution expedition to southern Idaho was fortunate in securing unusually good material of the extinct peccary, *Platygonus*. These remains, together with those of a variety of other mammalian forms, were found in deposits considered to be of late Pliocene age, exposed along the west side of the Snake River near the town of Hagerman, Idaho.

Many fragmentary specimens were found at various localities in

PaleoBios

Museum of Paleontology
University of California, Berkeley

Number 45

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October 31, 1987

Late Pliocene (Blancan) Scapanus (Scapanus) (Talpidae: Mammalia) from the Glenns Ferry Formation of Idaho

by
J. Howard Hutchison

PROCEEDINGS OF THE UNITED STATES NATIONAL MUSEUM



Vol. 45 No. 2

FOSSIL HARES FROM THE LATE PLOCIENE OF SOUTHERN IDAHO

By C. Lewis Gares

Assistant Curator, Division of Vertebrate Paleontology, United States National Museum

Among the fossil remains of late Pliocene mammals from Idaho are a number of species representing leporid types. Three distinct species are recognized, two of which are referred to the genus *Lepus*. The third was represented by a fragment of a mandible previously known from the Blancan of Asia. Considering the material are well preserved skull with the atlas and right radius of the mandible associated, four fragmentary jaws, an assortment of isolated teeth, and a few limb bones. The greater part of the National Museum material was collected by Elmer Cook, of Hagerman, from various localities south of the Pliocene (Blancan) quarry. A few specimens, however, (including the *Lepus* jaw), were encountered in the quarry during operations there by Smithsonian Institution parties.

A third species of *Lepus* is represented in collections mostly by a specimen from the Blancan (Blancan) locality near Grand View in southwestern Idaho. The fauna from Grand View is not identical with that from Hagerman, and although the difference may be attributed to the geographic separation of the localities, it seems likely that the two are of slightly different age. Presumably, the Grand View occurrence is of later date. The Grand View *Lepus* material was housed in the for study through the kindness of Dr. Charles S. Smith.

FIGURE 1

AN ABNORMAL S. IN CAVALI D. C. LATERAL FROM THE HAGERMAN LOCAL FAUNA OF IDAHO

The specimen was referred by Charles W. Whitcomb and party, 31 August 1966, to locality (H-10) in the Hagerman local fauna. It is the second largest of a small number of the Hagerman fauna that have been described locally as well as (Gares, 1968). The specimen is a portion of a left lower jaw containing one of the recently named genera, *S.* and *A.*, as far as can be determined, the Hagerman fauna is a highly variable group. It is quite long for its length as compared with those of known species. The specimen has the shape of the lower of the mandible of the specimen (H-10) as is given as *S.* in the Hagerman local fauna. The University of Michigan collection, however, the length of the jaw is 10 mm. It is described as a well-developed specimen that has the mandible which occurs in the same collection. The teeth are long and narrow, and the jaw width, compared with those of known species, is a fairly distinct pattern.



FIG. 1.—Mandible of *S. in cavali* D. C. LATERAL FROM THE HAGERMAN LOCAL FAUNA OF IDAHO.

OVERALL CONCEPT

The legislative mandate to provide a center for paleontological research and education will be completely met. A fully functional research center and museum will be built and operated, with the National Park Service performing research and education functions in conjunction with non-NPS partners.

PALEONTOLOGICAL RESEARCH

The National Park Service will jointly conduct an active research program with non-NPS scientists as peers and partners and will be responsible for active stewardship and management of the monument's paleontological resources. Researchers from outside the National Park Service will be encouraged to perform field and collections-based research concerning the monument's paleontological resources. The National Park Service will supervise and approve the permits required to perform such research. The National Park Service will also monitor research activities and ensure the long-term protection of the resources.

The National Park Service will provide sufficient facilities and staff to conduct its own research activities and to facilitate non-NPS research and other appropriate projects. This active involvement in research will ensure that the local staff will have a much more detailed knowledge of the deposits and collections and a broader view of the development of the science at Hagerman Fossil Beds than would be possible for offsite researchers. It will also give monument research more effective themes, goals, continuity, and context. Research, which may be international in scope, generally will be part of an established research program rather than oriented to individual projects. Researchers generally will be required to interact with educational groups and the public as part of their activities.

The research center and museum built on the selected site will have facilities, staff, and budget for research and education programs that will completely meet the monument's legislative mandates. NPS staff paleontologist(s) will conduct and supervise the paleontological research program and the paleontological resource management program as well. Sufficient additional NPS professional staff will be available to permit specialized functions that will help to facilitate and coordinate efforts to carry out these programs by NPS researchers and other professionals.

Research partnerships will be aggressively pursued. "Friends of the monument" groups and other organizations will be encouraged to actively support research and other monument programs. Such support could include assistance with funding, staff, equipment, and facilities. A non-NPS institute also needs to be established to provide affiliations with universities and other appropriate entities to provide academic credit, research grants, and other activities that are unavailable to the National Park Service but are necessary to support a center for paleontological research.

Hagerman Fossil Beds will be a focus for research activities in which the resources will remain in close contact with their context. The National Park Service will meet all obligations for proper management of the resource and will consider the highest use of the resource to be for paleonto-

logical research. Its unique circumstances will provide an opportunity to conduct and facilitate scientific research onsite and to remain current with the use of the latest available technologies for paleontological research.

The research center and museum will include capabilities for field research as well as for preparation and analysis of specimens and relatively complete collections for the site. The bulk of paleontological research regarding Hagerman resources will be performed onsite, but not necessarily by NPS personnel. The research center will have the capability for onsite performance of virtually all steps in the entire process of paleontological research, from field collection and documentation of the fossils and their context through preparation, analysis, and curation of specimens and their associated data. A critical mass of professional, technical, and support personnel and facilities will be provided, augmented by outside personnel and facilities as needed to keep the center at or near the cutting edge of the profession. Research at Hagerman probably will be field-based at first, but as the onsite paleontological collections grow and expand, there will be an increasing use of these collections as part of the research conducted at the monument.

The research center and museum will have proper collection storage facilities for fossil material, appropriate data management capabilities, proper facilities for the preparation of fossils for study, adequate laboratories for analysis of specimens, and an up-to-date research library with relevant publications and journals. Offices and workspace for NPS employees and visiting researchers also will be provided, as will support staff to meet the needs of the ongoing research.

Consistent with the National Academy of Science *Report on Science in the National Parks* and the *Vail Agenda* of the National Park Service, the monument's research center can serve an outreach role to assist other parks with expertise on call, provide proper preparation and curation of paleontological specimens from other parks, and facilitate paleontological research and resource management at other parks upon request. This role could be similar to NPS professional archeology centers.

In conjunction with the monument's mandates to provide for interpretation and education related to its paleontological resources, the research center and museum will also play a role in educating the public and students about the science of paleontology and its procedures, methodologies, and processes. The continuing paleontological research will be made accessible to the public either directly or indirectly to some degree.

Some types of paleontological research activities such as major excavations could disturb large amounts of vegetation and soil. Most field research activities, including the salvage of specimens exposed by erosion, will involve minimal disturbance of surface and subsurface resources. To facilitate paleontological research activities and to ensure adequate protection of monument resources and compliance with all applicable laws, regulations, and policies, further environmental compliance actions will not be required for paleontological research activities if they meet all the following criteria:

- ◆ They will take place in the paleontological research subzone, as shown in the Management Zones map.
- ◆ They will disturb no more than 100 square feet of surface.

- ◆ They will involve no chemicals or hazardous substances that could cause long-term impacts.
- ◆ The area that will be affected does not contain any plant or animal species of special concern, or cultural resources, or any other resource or action for which there is a requirement for site-specific environmental compliance actions or special permits or approval of other agencies.
- ◆ Adequate erosion control measures and safety measures will be included in the activities in compliance with all laws, regulations, and policies.
- ◆ Upon completion of the research activities, unneeded soil will be replaced and the site returned as close to its condition before the research as reasonable.

Paleontological research activities not meeting all of the above criteria will require site-specific environmental compliance actions. Research activities meeting the above criteria will have minimal effects on the monument environment because they generally will occur in areas of active erosion, in areas without sensitive nonpaleontological resources, and in areas where such research is necessary to meet the monument's legislated mandate regarding paleontological research. Standard stipulations will be incorporated into all research permits to require cessation of activities if sensitive natural or cultural resources are found during the course of activities, and to include NPS inspection of the site and activities at all times.

RESOURCE MANAGEMENT

The National Park Service will conduct a fully professional paleontological resource management program. The resource management program for cultural resources and for nonpaleontological natural resources and values will not receive the same emphasis but will meet all requirements. The staff and budget support will be adequate to provide professional services for all resources and values. Baseline studies of monument resources and values, including plants and animals, will be conducted.

The National Park Service will work to perpetuate the integrity of natural ecosystems by maintaining or restoring natural processes to the extent practicable. Sites disturbed by past, present, or future human activities in the monument generally will be revegetated with native species to stabilize soils, restore native ecosystems, and reduce the opportunity for nonnative plants to become established. Runoff for existing and future facilities will be controlled in compliance with state regulations.

Before undertaking any actions, the National Park Service will conduct more detailed site-specific surveys and environmental compliance for areas proposed for development. If it is determined that threatened, endangered, rare, or sensitive species could potentially be affected by such actions, the National Park Service will consult with the U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game to determine appropriate mitigative measures to avoid adverse impacts.

The National Park Service will comply fully with the NPS *Management Policies* (1988), the Clean Water Act, as amended, the Rivers and Harbors Act, Executive Orders 11988 (Floodplain Man-

agement) and 11990 (Protection of Wetlands), NPS *Floodplain Management Guidelines* (1993), NPS *Protection of Wetlands Guidelines* (1977), and other applicable laws and regulations. Actions will be taken to restore, maintain, and enhance water resources in monument areas, to enhance and restore floodplain and wetland values, to avoid modification or development in floodplains and wetlands when practicable alternatives exist, and to mitigate adverse impacts if a floodplain or wetland would be occupied or modified.

All visitor and research activities will be monitored, and appropriate action will be taken on the basis of monitoring results. This will be done to ensure the protection of monument resources and values, research, and visitor experience.

Many monument resources and values are dependent on clean air. The monument's exceptional visual quality constitutes a prime air quality-related value requiring protection. The National Park Service will comply fully with the NPS organic act (1916), the Clean Air Act amendments of 1977, and the NPS *Management Policies* (1988) to promote the best possible air quality in the monument because of its critical importance to human and environmental health, visitor enjoyment, and scenic quality.

To ensure protection of any unknown cultural resources, archeological surveys will be conducted on all lands that could be affected by specific development proposals or other ground-disturbing activities, including possible new trails and paleontological excavation sites, well before those proposals are implemented. If avoidance is not feasible, any potentially adverse effects on cultural resources will be mitigated by actions developed in consultation with neighboring American Indian groups, the state historic preservation officer, and the Advisory Council on Historic Preservation, as stipulated in 36 CFR 800. The National Park Service will fully comply with sections 106 and 110 of the National Historic Preservation Act of 1966, as amended.

In accordance with the memorandum of agreement of April 12, 1995, between the Idaho state historic preservation officer and the National Park Service, mitigation for adverse effects on the historic structures and fabric of the research center and museum site will be achieved, at a minimum, through photographic documentation of any affected portion of the site. In addition, the National Park Service will seriously consider adaptive reuse of the site, to the extent possible, as a contribution to regional cultural resource management.

The management of the Oregon Trail segment in the monument will be coordinated with the interagency effort for comprehensive management and use of the entire Oregon Trail. The trail segment will be managed in accordance with its status as a segment of a national historic trail.

EDUCATION, INTERPRETATION, AND ORIENTATION

The National Park Service will participate in regional information and visitor centers and provide regional information and orientation at NPS facilities. The National Park Service also will participate in cooperative local and regional planning and public/private partnership initiatives.

Visitors will have access to most parts of an integrated museum and research center. Although this facility will be the primary focus for visitor activities, a wide variety of programs in the field also will be offered, with interpretation and educational programs and curriculum support for

students and the general public at all levels. Programs will emphasize the interaction of the audiences with scientific programs and information, including direct involvement with researchers. While paleontology will remain top priority, all the monument's natural and cultural resources and values will be included as appropriate in interpretation and education programs.

Visitors will be directed to stop first at the research center and museum for orientation to resource sensitivity and visitor experience opportunities. The story of the monument and its significance also will be interpreted. Repeat visitors and local residents will be able to proceed directly to the overlooks on Bell Rapids Road (see the Monument map). For this audience, especially, it will be important to repeat basic interpretation, orientation, and resource management messages with outdoor media and personal services at overlooks and parking areas.

Both personal and nonpersonal interpretive services will be available to visitors to the research center and museum. Services will focus on the primary interpretive themes, with emphasis on resource-based paleontology in a broad context. Personal services may include an attended information area, roving and stationed interpreters conducting talks and demonstrations (including preparators in a fossil preparation area), a video conference facility, and interpretive talks in the center. Roving interpretation and guided walks may be offered on trails around the research center and museum. Nonpersonal services in the center could include exhibits, audiovisual programs, interactive computers, and publications. Wayside exhibits in and around the center will interpret views of the Snake River and the monument across the river.

Visitors will stay at the research center and museum for varying amounts of time. There will be those who seek a rest stop and a quick overview, who will stay perhaps 30 to 60 minutes. Most visitors, however, will be seeking a more significant interpretive and educational experience and will stay two hours or more to enjoy the interpretive media, talks, and demonstrations. Even longer visits will be expected for people who choose to participate in guided walks or other activities that the monument offers. Because some subjects are best communicated with scheduled audiovisual or personal programs, self-

The following definitions and descriptions are used in this document:

Education: Activities with goals similar to those of interpretive activities, but conducted with organized and scheduled groups such as schools, youth groups, and neighborhood or community groups. Activities are scheduled, and attendance generally is known in advance. In addition to meeting NPS objectives, educational activities with schools generally are designed to correspond to school curricula as well as NPS themes and goals; pre-site and post-site activities and media are frequently employed. Environmental education generally refers to activities based on natural history; heritage education generally incorporates cultural history topics.

Interpretation: Activities or media designed to enable visitors or offsite program participants to better understand, appreciate, protect, and enjoy the resources and experiences. Visitors may attend programs without advance notice to the National Park Service. Examples of formal personal interpretive programs are guided walks, talks, and slide shows. Examples of informal personal interpretive activities are demonstrations (such as fossil preparation), information services, and roving interpretation (for example, informal contacts along a trail or at an overlook). Examples of nonpersonal interpretive media are exhibits, audiovisual programs, publications, and wayside (outdoor) exhibits.

Orientation: Activities designed to orient visitors to resources, recreational and interpretive opportunities, safety and resource management issues, nearby and related recreational opportunities, and visitor services such as food and lodging. Orientation can be accomplished through personal or nonpersonal means. The chief component of orientation is information: giving visitors the necessary information to make choices. An additional component of orientation to park-related resources and activities is motivation: encouraging visitors to take advantage of opportunities.

Interpretive Themes

The monument's interpretive themes are summarized below. More detailed descriptions can be found in the interpretive prospectus for the monument.

Hagerman Fossil Beds National Monument contains the richest known late Pliocene fossil deposits in the world in terms of quality, quantity, and diversity.

Interpretive themes are ideas, concepts, or stories that are central to a park's purpose, identity, and visitor experience. Themes provide the framework and backbone of a park's interpretive program, and every visitor should have easy access to them. They provide direction for planners and for designers of exhibits, publications, and audiovisual and personal programs. They also enter into considerations about facilities and carrying capacity.

The monument's fossil record includes plants and animals (including the Hagerman Horse) that lived at Hagerman about 3.5 million years ago in a wet, mostly forested floodplain.

National park system areas such as Hagerman Fossil Beds National Monument are created to preserve nationally significant resources and to be enjoyed by current and future visitors. Visitors can help by leaving fossils in place and respecting all other monument resources.

Paleontology is a science that tells the story of past life on earth, as well as revealing valuable insights about life today.

Paleontologists are scientists with the added skills of explorers and detectives who study past life on earth.

There have been several paleontological investigations in what is now Hagerman Fossil Beds National Monument. The first was conducted by the Smithsonian Institution in 1929.

The primary geological story of Hagerman spans about 4 million years and includes Pliocene sediments, lava flows, and the Bonneville Flood.

Hagerman Fossil Beds National Monument is one of more than 360 units in the national park system and one of nine national park system areas that preserve and interpret major fossil deposits.

People have lived in the Hagerman Valley at least 7,000 years. In the 19th century, American Indians traded fish for other goods with fur trappers and with pioneers on the Oregon Trail, the ruts of whose wagon wheels can still be seen in the monument.

Irrigated farming, hydroelectric dams, residential development, and increasing ease of transportation are important contributors to the 20th century history of Hagerman Valley. The national monument will also play a role in the area now and into the 21st century.

The present monument looks very different from the way the area looked during the Pliocene. Vegetation is dominated by an arid sagebrush/grass complex with riparian species along the Snake River. Wildlife includes significant seasonal waterfowl populations.

directed media, exhibits, and activities will be available to keep visitors interested until scheduled activities start.

A variety of learning experiences will be available to accommodate the diversity of visitor backgrounds, interests, learning styles, and expectations. A full range of interpretive and educational media and activities will be offered. Primary emphasis will be placed on making paleontological research, significance, principles, and activities accessible and compelling to visitors.

Visitors will have frequent and varied access to researchers and the research process. Fossil preparation will be demonstrated and interpreted. Visitors will be able to "excavate" and analyze fossils in self-directed participatory activities. Activities for families and other groups will encourage exploration and interaction in small groups of different ages. Researchers and monument employees will give frequent talks and demonstrations. A video conference link or satellite television might provide access to researchers across the river as well as at other sites.

Onsite interpretation of resources will include guided walks and self-guided experiences through wayside exhibits or interpretive brochures. Interpretation will concentrate on paleontological resources, but a significant effort will be made to interpret the natural environment as well as the Oregon Trail and other cultural resources.

Environmental education will be an important program at Hagerman, and NPS themes and goals will be matched with school curricula and other group objectives. Programs, which will be cooperatively conducted through partnerships, will be led by NPS employees, researchers, volunteers, teachers, and other group leaders. In general, researchers, NPS staff, and other subject-matter experts will conduct in-depth programs for diverse audiences. The National Park Service will conduct most programs where both detailed subject matter knowledge and communication expertise are needed; teachers, group leaders, and volunteers will conduct introductory programs and activities with younger audiences. All educators will receive intensive training in both subject matter and educational methods. Teacher workshops and staff and volunteer training programs will receive high priority, funding, and staffing.

Educational programs may last from one hour to several days. Most groups will come from southern Idaho, especially from nearby population centers such as Boise, Twin Falls, and Pocatello. Participants will have opportunities to become involved in paleontological research activities and to learn the principles and practical techniques of paleontology as well as the larger concepts of ecology and scientific inquiry. The education program also could teach skills and concepts related to such curriculum areas as general science, the history of science, geology, history, and government. Activities will take place at the research center and museum, on the monument side of the river, and offsite. Video conferencing or satellite television might provide real-time access to researchers in the field and at other sites around the world. Different paleontological sites may be electronically linked together for enhanced educational programming.

Educational activities at the research center and museum will take advantage of all public interpretive media, as well as special facilities such as activity rooms. Also used for education will be research facilities such as the library, study collection, and computer and video networks with other paleontological areas.

Offsite programs will be presented to schools, clubs, and other organizations. Programs will be prepared and presented upon request and in response to an organized outreach program that

will seek to meet NPS resource, visitor, and neighboring community objectives through offsite activities. Public programs and displays will be presented outside the monument; for example, at fairs and shopping malls. Many visitors will receive orientation information before their visits; this will be available through the mail, by telephone, or by electronic mail, as well as at welcome centers and other tourist information centers.

Orientation will be available in the research center and museum. Visitors will be able to get desired information in a variety of formats — media could include maps, brochures, computers, audiovisual programs, exhibits (such as topographic models), and personal services. Basic orientation information will be available at each developed area west of the river.

FACILITIES

Facilities at the research center and museum will fully meet the legislative mandate to provide a center for paleontological research and education. This will include fully professional facilities for research, laboratory analysis, specimen preparation, and curation. In addition there will be a research library, a computer interlink, classrooms, lecture space, and research areas. The research center and museum will be designed to facilitate interaction among visitors, students, and research scientists.

NPS headquarters and park operations functions will be housed at the research center and museum site in existing or new buildings. Exact plans depend on detailed planning and design, which will be possible only after the site is acquired. The site of the research center and museum will contain public parking, picnic facilities, restrooms, interpretive trails, and wayside exhibits. It could also contain a floating dock for commercial boat tours and NPS operations. There will be no facilities in downtown Hagerman except for possibly an information kiosk.

NPS employees will find housing outside the monument. Onsite federal housing will not be provided as a component of the monument's operations, although the National Park Service may work with community interests to ensure adequate opportunities for housing for employees and others associated with monument programs. If warranted by security needs at the research center and museum site, limited employee housing at that location could be considered.

Except for trails, the preferred location for facilities will be previously disturbed areas. Facilities will not intrude on riparian zones, wetlands, or other sensitive areas. Trails will be routed and constructed to minimize impacts on vegetation, soils, and other resources.

The private sector will be encouraged to offer visitor services (such as camping, food, and lodging) outside the monument. Concessions for such services will not be available in the monument.

The Snake River overlook and the Oregon Trail overlook will be improved to be permanent, with permanent parking lots, wayside exhibits, trails, trash receptacles, and toilets as needed, but no water or sewer. The Hagerman Horse Quarry overlook will be improved only the minimum needed to facilitate research, interpretation, and education activities. Access to the overlook will be restricted to protect resources and research activities.

ACCESS

Motor vehicles, including motorcycles and off-road vehicles, will be allowed only on designated roads, with vehicle parking only in designated areas. Hiking, bicycling, and livestock use will be allowed only on designated roads and trails unless they are conducted as part of a permitted or supervised activity.

After public notice and review the superintendent will carefully review alternatives and public comments and then decide what restrictions, if any, should be imposed in designating roads and trails for specific uses. The designations will specify conditions under which specific types of uses will be allowed. It is not the intent of this plan to totally ban livestock users, hikers, or bicyclists from any designated road or trail unless absolutely necessary to protect resources, values, public safety, research, or other authorized activities. Restrictions less than a total ban normally will be tried before a total ban of any of these uses will be considered for any designated road or trail.

The road(s) accessing the Hagerman Horse Quarry area will be improved only to prevent resource damage and provide reasonable access for persons with permits (including researchers) or participating in an activity supervised or approved by the National Park Service. Signs or other methods will discourage unauthorized access to the area of the Hagerman Horse Quarry. A parking area consistent with the above provisions also might be added. Site-specific design, environmental compliance, and public review will be required before any parking area can be constructed in the Hagerman Horse Quarry area.

The National Park Service will not provide shuttle buses or other public transportation. An analysis conducted for this plan did not support the feasibility of or need for public transit (NPS, Wolf 1995b). However, transportation services could be provided by the private sector. This does not preclude provision by the National Park Service of vans or buses to transport participants in research, educational, interpretive, or other programs. The National Park Service will work with interested parties in the public and private sectors to create partnerships for providing appropriate transportation services if necessary.

The existing roads and trails (shown on the Monument map) will be designated as open for appropriate uses as long as resources and research activities remain unimpaired. However, a carrying capacity will be established, and a regular monitoring program will be instituted to determine acceptable use levels and impacts. Restrictions based on the carrying capacity and monitoring results can be considered on a case-by-case basis after public notice and review.

The pump access road will not be improved but will remain a dirt road maintained by the pump operator to allow access to the Fossil Gulch pump station. The road will be signed "unimproved road, use at your own risk." It will remain open to unrestricted visitor use unless resource impacts become unacceptable, maintenance of the road for public use becomes cost-prohibitive, restrictions are requested by the pump owners/operators, public safety problems arise, or use becomes too heavy. Restrictions on the use of the pump access road will be considered only after public notice and review.

The Bluff Trail, the Emigrant Trail, and the Rim-to-River Trail will be constructed for day use only, as shown conceptually on the Monument map. Detailed planning, design, and environmental compliance will be carried out before completion of these trails.

Bell Rapids Road and the access road into the research center and museum site will be paved. The parking areas for the Snake River and Oregon Trail overlooks also will be paved.

Commercial boat tours on the Snake River for purposes of interpretation will be encouraged. This could be accomplished through a commercial use license, a limited business partnership, or other appropriate means. A dock could be considered as part of the research center and museum site, subject to a future planning process. However, no facilities will be provided for landing on the monument bank of the river.

VISITOR EXPERIENCE

Visitor experience will be focused at the research center and museum, but visitors will be encouraged to extend their visits to other monument areas and programs. The monument will be seen by visitors as an active research area in which they can participate at some level.

The National Park Service will provide structured and interpreted access to monument resources for the majority of visitors. Visitors will be encouraged to spend considerable time at the research center and museum, where the significance and interpretive themes of the monument will be communicated in a variety of ways. Experiences on the monument side of the river will be personally guided or restricted to trails and overlooks and will be interpreted by wayside exhibits, brochures, or personal services.

There are several reasons for this high degree of supervision and direction for the visitor experience. The monument's primary resources (for example, fossils and Oregon Trail ruts) are fragile and highly susceptible to impact by visitors, and the story of the monument is much more than fossils as trophies — guidance is required to make the story accessible and understandable to most people. The interest of visitors who want to see fossils in situ will be dealt with carefully so that both fossils and visitors will be protected. Hagerman fossils are especially susceptible to human disturbance, since most are small and can be easily picked up off the ground. Unstable and steep slopes can be hazardous. For these reasons, visitors will be allowed in most fossil-bearing areas only on guided programs.

Six areas will be accessible to unguided visitors: the Oregon Trail overlook, the Snake River overlook, the Emigrant Trail, the Bluff Trail, the Rim-to-River Trail extending north of the monument, and the hunting and fishing subzone next to the Snake River. These and other areas will be patrolled and attended by interpreters, maintenance staff, protection rangers, researchers, and volunteers.

Hunting, Fishing, and Camping

In the hunting and fishing subzone, hunting and fishing and maintenance of structures associated with those activities will continue as legislatively mandated. These activities will be cooperatively managed as described in the section on the hunting and fishing subzone. Camping in the monument will be prohibited.

Carrying Capacity

All general management plans are required by Public Law 95-625 to identify visitor carrying capacities, which are defined as the type and level of visitor use that can be accommodated while sustaining the desired resource and social conditions that complement the purposes of the monument and its management objectives. Carrying capacity in this context is a prescription for desired resource and social conditions rather than a prescription for a particular number of people. The monument purpose, significance, management goals, desired future conditions, management zones, and interpretive themes are all essential elements in developing the resource and social indicators and standards, monitoring programs, and management strategies that make up visitor carrying capacity.

As a new unit of the national park system, Hagerman Fossil Beds National Monument has little information about visitors and resources. Such information is needed to develop effective and measurable indicators and standards, monitoring programs, and management strategies.

The monument, which has few existing facilities, has an opportunity to incorporate carrying capacity considerations into facility design. However, carrying capacity cannot be controlled completely through facility design in the monument primarily because visitor access along Bell Rapids Road cannot be restricted, since it is a public road and there is and will be no entrance station for the monument. Experience in other units of the national park system shows that where, for example, parking demand exceeds capacity, visitors generally will park somewhere, even if their parking creates traffic and safety problems.

Although facility design is important, carrying capacity at Hagerman Fossil Beds will be controlled mainly through less direct means, by encouraging visitors to be in locations with adequate capacity rather than in crowded locations. This will be accomplished primarily by directing all visitors to the research center and museum. Signs will use the name Hagerman Fossil Beds National Monument only when referring to those facilities. For example, there should be a sign identifying Bell Rapids Road at its intersection with U.S. Highway 30, but the sign should not indicate that the road is associated with Hagerman Fossil Beds National Monument. Visitors should acquire that knowledge only at the research center and museum or through prior experience at the monument. Orientation information provided by the monument also will direct visitors only to the research center and museum. The message must be clear that all visitors should go there.

When visitation is below capacity, visitors will be encouraged to visit the overlooks and trails; at times when visitation to these features approaches capacity, they will not be encouraged to learn about or visit them. At those crowded times, additional activities may be offered at the research center and museum to encourage visitors to stay there and not look for additional experiences in the monument.

The social and resource considerations that have already been incorporated into the design of existing facilities will be developed into indicators and standards for carrying capacity in the following ways. The parking areas at the Snake River and Oregon Trail overlooks were constructed in existing disturbed areas to avoid any direct resource impacts outside the existing footprint. Similarly, all parking areas proposed in this plan will be limited to existing disturbed areas and will not be enlarged beyond today's disturbed area boundaries in the future. In the

existing disturbed areas, parking areas will be sized to accommodate no more than the carrying capacities of the adjacent overlooks and trails.

The Snake River and Oregon Trail overlooks have been constructed for a capacity of about one busload of people (about 40 people) and have been designed to encourage people to stay on the trail and overlook surfaces to prevent spreading resource impacts. They were also designed with the idea that usually only one or two small groups will be at the overlook and that the full capacity will be reached only rarely, for special events or during peak season. When this premise is translated into preliminary indicators and standards, 80% of the time no more than three groups of people (with a total of no more than 15 people) will be at each overlook at one time. The other 20% of the time as many as 45 people from a large busload or several carloads could be present, but 80% of the time when this level occurs it will be due to a scheduled interpretive program. In all cases, evidence of visitors walking off the trail and overlook surfaces will be minimal (measurable standards will need to be developed to define what this means). The goal of the indicators and standards will be to ensure an uncrowded, contemplative visitor experience with little or no evidence of resource impacts away from hardened surfaces.

The preliminary indicators and standards described above for the Snake River and Oregon Trail overlooks will be applied on an interim basis to all overlooks and trails. They will be reconsidered not more than two years after completion of the *General Management Plan* on the basis of a monitoring program. The monitoring program will determine (a) if any changes to the preliminary indicators and standards are needed (including making them more specific and measurable), and (b) if visitor activities have caused the standards to be exceeded, requiring management action.

The carrying capacity of the research center and museum will be determined by the capacities of the facilities. The research center and museum will be designed to handle at least 186,000 visitors per year and to be expandable in case of a significant increase in visitation.

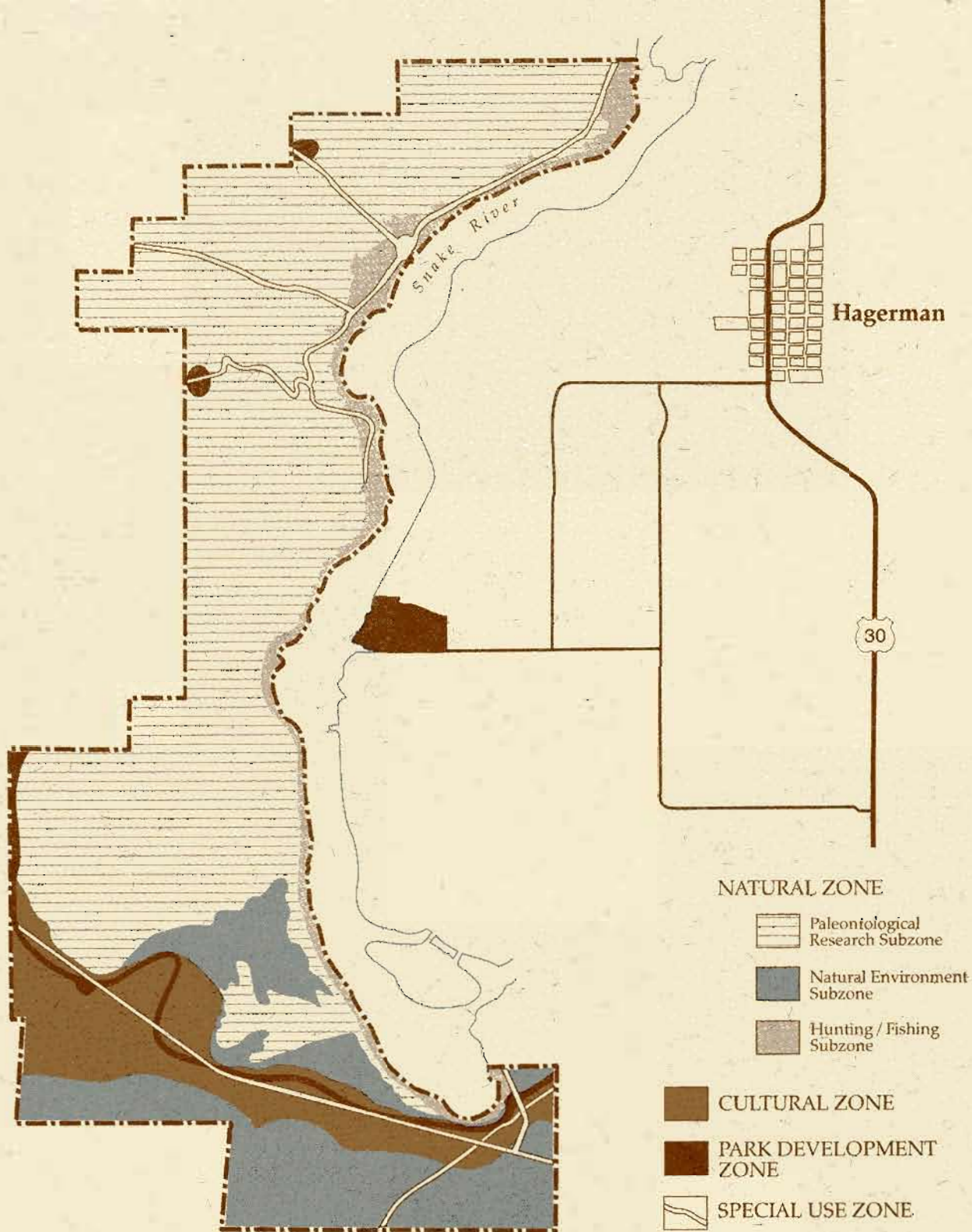
MANAGEMENT ZONES

The management zones for Hagerman Fossil Beds National Monument are shown on the Management Zones map and described in the following sections.

Natural Zone

Approximately 82% of the monument will be designated a natural zone. In the natural zone will be three subzones, as described below. The natural zone will be managed to conserve natural resources and ecological processes and to provide for their use and enjoyment by the public in ways that do not adversely affect these resources and processes. Development in the natural zone will be limited to dispersed recreational and essential management facilities that

National Park Service Management Policies (1988) require that general management plans "prescribe a system of management zoning for park lands and waters to designate where various strategies for management and use will best fulfill management objectives and achieve the purpose of the park." Management zones, which are prescriptive, are used as a framework for specific planning and management decisions on the use and development of the monument. They are derived from an evaluation of the monument purpose and significance, management goals, desired future conditions, and the nature of the monument's resources and uses.



Management Zones

Hagerman Fossil Beds National Monument

U. S. Department of the Interior / National Park Service
300/20020/DSC/Sept. 95



North 0 .5 1 mile

have no adverse effect on scenic quality and natural processes and that are essential for the management, use, and appreciation of natural resources.

Paleontological Research Subzone. Approximately 57% of the monument will be designated a paleontological research subzone. This is approximately 70% of the designated natural zone. Although the basic management strategy of the natural zone will apply, manipulative research and resource management activities consistent with the monument's purpose can occur in this subzone even though such activities otherwise would not be compatible in natural zone areas. This subzone will include most of the monument.

The bulk of the monument's paleontological field research and resource management activities will occur in this subzone. While preserving natural ecosystem processes, natural resources, and cultural resources will be important goals in this subzone, they must be measured against the scientific value to be obtained through activities such as excavation of paleontological resources. Attempts will be made to minimize impacts on resources and ecosystem processes while research activities are conducted, but management decisions generally will favor the best paleontological science over protection of nonpaleontological resources if such a tradeoff is necessary.

Visitor use in this subzone will occur under restrictions such as permits or supervision to ensure that such use will be compatible with research activities, resource protection, protection of scientific values, and other management objectives. Interpretive facilities (including wayside exhibits) generally will not be constructed in this subzone. Visitor trails will be restricted to existing disturbed areas such as abandoned roadbeds or utility access corridors, except for cliff-top areas, where limited new trail construction can be considered.

Natural Environment Subzone. Approximately 17% of the monument will be designated a natural environment subzone. This is 21% of the lands designated in the natural zone. The basic management strategy for the natural zone will predominate in this subzone, which generally will include the extreme southern end of the monument and the relatively flat land just north of Bell Rapids Road.

There are two primary differences between this subzone and the paleontological research subzone: (a) in the natural environment subzone the National Park Service can decide, subject to public notice and review, to construct designated trails for visitor appreciation of the resources; and (b) restrictions such as permits or supervision may or may not be required. All trails in the natural environment subzone will be for nonmotorized use only. Hiking, bicycling, and/or livestock use can be allowed as determined appropriate. Paleontological resources can be excavated, but the standards for resource protection in this subzone will be stricter than those applied in the paleontological research subzone.

Hunting and Fishing Subzone. Monument lands within 50 feet in elevation above the high water level along 7 miles of shoreline of the Snake River will be designated a hunting and fishing subzone. This will encompass approximately 7% of the monument and 9% of the natural zone. This designation will permit hunting and fishing and the maintenance of structures necessary for those activities, as legislatively required. Hunting and fishing normally are seasonal activities; when no hunting or fishing is occurring, the subzone will be managed the same as the paleontological research subzone adjoining it.

The monument superintendent will consult with the Idaho Department of Fish and Game and the public to ensure the protection of monument resources, values, public safety, research, and other authorized activities. Under cooperative management, hunting and fishing activities will continue to be permitted as legislatively required. People engaged in hunting, fishing, or other authorized activities generally will be allowed to travel on foot anywhere in this subzone.

Cultural Zone

Areas designated as a cultural zone will be managed to preserve, protect, and interpret cultural resources and their settings and to provide for their use and enjoyment by the public. In Hagerman Fossil Beds National Monument, the cultural zone generally will include the area of the Oregon Trail and will encompass 12% of the monument. Preservation and interpretation of the cultural values associated with the Oregon Trail will take precedence in this zone. This may include providing trail access for visitors, consistent with cultural resource protection laws and policies.

Park Development Zone

Approximately 2% of the monument will be designated the park development zone. The entire 55-acre site for the research center and museum, which is awaiting congressional action for inclusion in the monument, will be in this zone. Areas in this zone will be managed to provide and maintain facilities serving park managers and visitors. This zone also will include Bell Rapids Road, the overlooks adjacent to that road, and small areas overlooking the Hagerman Horse Quarry and at the top of the pump access road.

Areas in this zone generally can be developed for facilities in support of management, research activities, and visitors.

Special Use Zone

The areas in the special use zone, according to the NPS *Management Policies*, "will include lands and waters that the National Park Service anticipates will continue to be used for activities not appropriate in other zones." They also could contain "uses carried out by other government agencies or private interests on lands within exterior park boundaries; NPS administrative control over the use of lands in this zone is either lacking or secondary to that of another party" (NPS-2, "Planning Process"). This zone will primarily include existing utility corridors and pump-related facilities such as the pump access road, pumps, and pipeline. It encompasses approximately 3% of the monument.

Consistent with legislation and property rights, these facilities can be operated and maintained to accomplish their purpose. However, if the operator or owner of these facilities no longer wants to operate and maintain the facilities for any reason or if he should want to relinquish any or all rights to the facilities or rights-of-way, the National Park Service could, subject to public notice and review, consider removal of the facilities and rehabilitation and management of the areas the same as the adjoining zone or subzone.

With the concurrence of property owners or facility operators, the National Park Service could consider using the utility corridors or roads in this zone as trails for nonmotorized use such as hiking, biking, or livestock use, consistent with the management of adjacent zones or subzones and NPS laws and policies.

FUTURE ACTION PLANS

The *General Management Plan* provides overall guidance for most major monument issues. However, one of its objectives is to identify what additional future action plans will be needed to address specific issues in greater detail. Future plans and studies needed for the monument are as follows:

A boundary study is needed to consider alternatives for addressing issues regarding the monument's boundary, such as (a) legal access to some parts of the monument, (b) additional fossil sites outside the monument, (c) visual resources, and (d) effects on monument resources from activities outside the monument.

A land protection plan is needed to consider alternatives for addressing issues, such as (a) the state-owned section 16, which contains the site of the Hagerman Horse Quarry as well as irrigation-related facilities in the monument, (b) more detailed management strategies for utility rights-of-way and irrigation-related facilities such as the pump access road, and (c) the Bell Rapids Road, which is owned and maintained by the Twin Falls Highway District.

Additional baseline inventory and monitoring studies are needed for virtually all monument cultural and natural resources, as well as monument visitors.

Monitoring programs are needed to measure the effects of actions called for by this *General Management Plan* on monument resources and visitors, including carrying capacity.

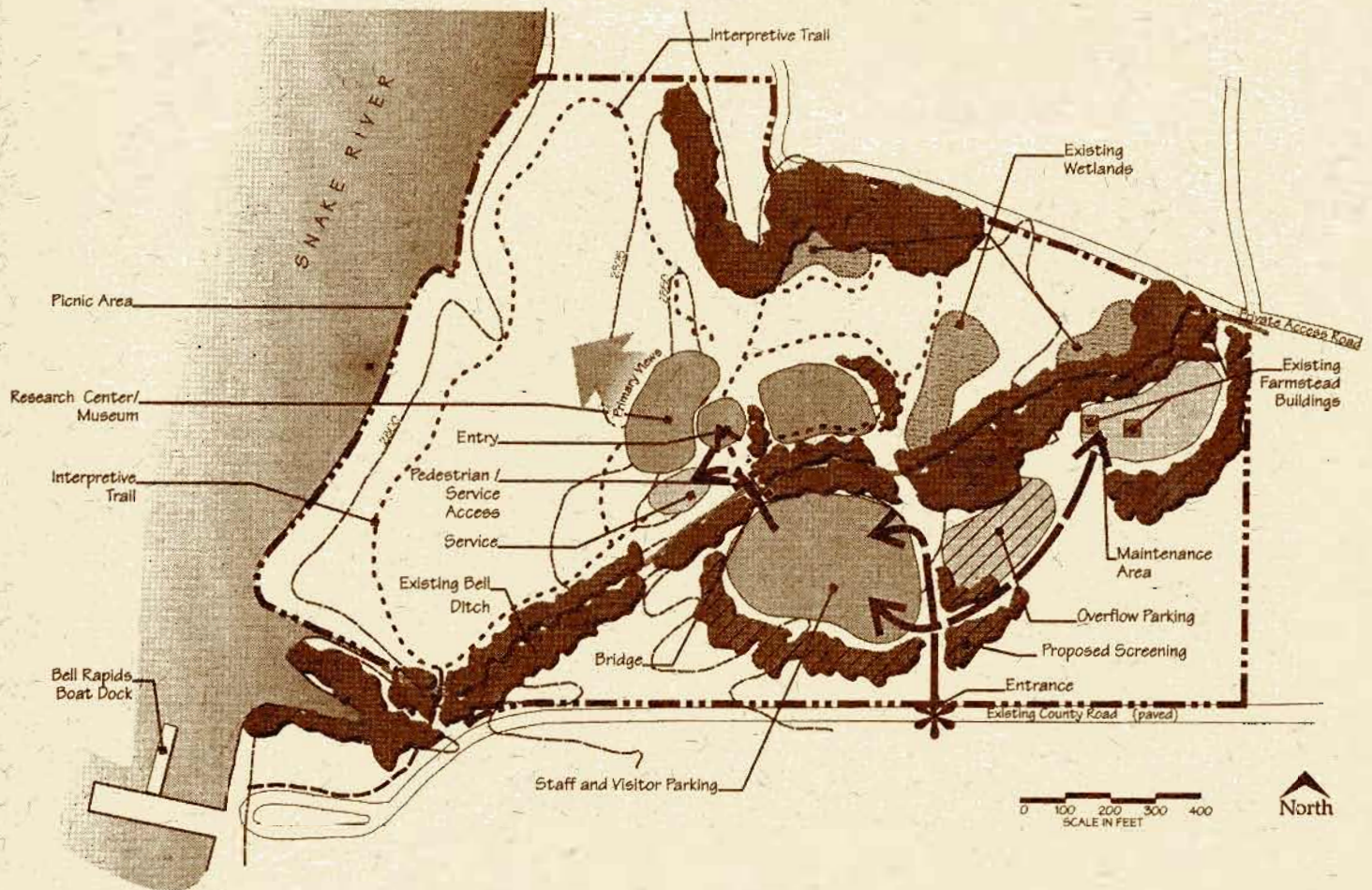
Studies and recommendations for mitigative actions regarding threats to monument resources, such as landslides, need to be completed or continued, as appropriate.

Site-specific survey, design, and environmental compliance will be necessary for virtually all implementation actions called for by this plan.

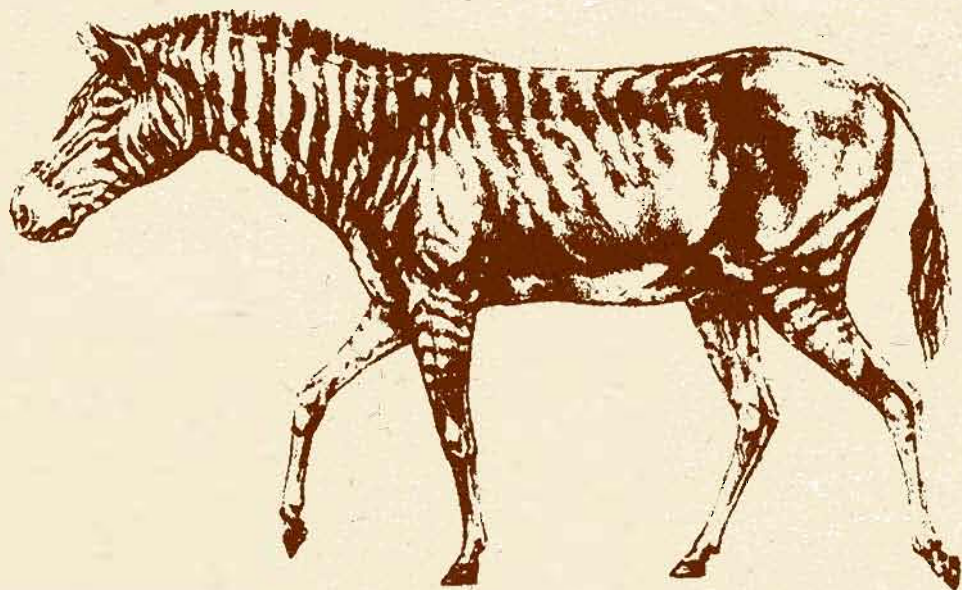
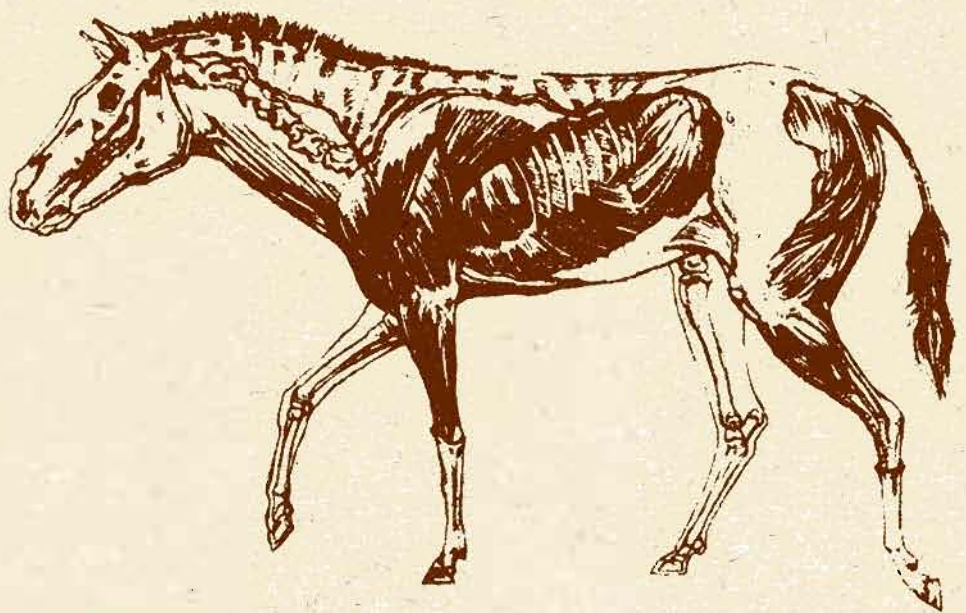
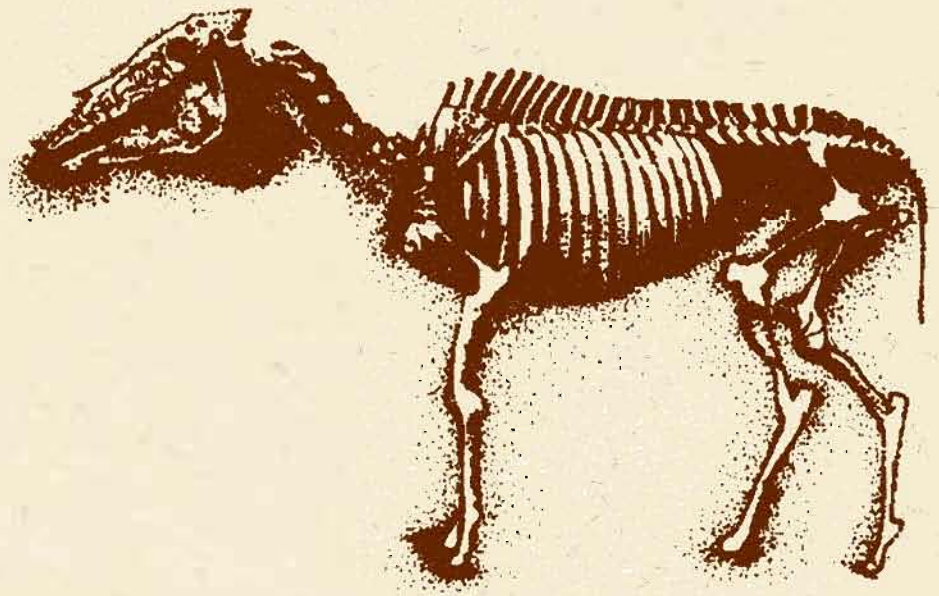
An existing draft resource management plan for the monument (NPS 1993b) needs to be updated. The update, which will be based on this *General Management Plan*, will provide detailed guidance on the projects, plans, objectives, strategies, and budget needed to manage the monument's natural and cultural resources. Detailed action plans called for by the resource management plan will include the following:

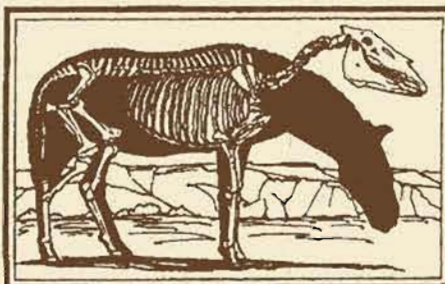
- ◆ a paleontological research program plan and a collections management plan to guide decisions regarding paleontological resources in the ground and in the collections (although the collections plan should also address nonpaleontological natural and cultural resources in the monument's collections)

- ◆ a water resource management plan, which will address in detail all aspects of monument water resources, including floodplains and wetlands
- ◆ a fire management plan, a vegetation management plan, a wildlife management plan, and a management plan for hunting and fishing to address baseline studies, resource protection, public safety, and restoration of natural ecosystem components
- ◆ a cultural resource management plan to address detailed protection of the monument's historical, archeological, and ethnographic resources, including the Oregon Trail



Conceptual Drawing of Research Center site





Monument Resources

ERA	YEARS BEFORE PRESENT
CENOZOIC	RECENT
	11 THOUSAND
	PLEISTOCENE
	2 MILLION
	PLIOCENE
	5 MILLION
	MIOCENE
MESOZOIC	25 MILLION
	OLIGOCENE
	36 MILLION
	Eocene
	58 MILLION
PALEOZOIC	PALEOCENE
	63 MILLION
	CRETACEOUS
	135 MILLION
	JURASSIC
	180 MILLION
	TRIASSIC
	230 MILLION
	PERMIAN
	280 MILLION
	PENNSYLVANIAN
	310 MILLION
	MISSISSIPPIAN
	345 MILLION
	DEVONIAN
	405 MILLION
	SILURIAN
	425 MILLION
	ORDOVICIAN
	500 MILLION
	CAMBRIAN
	600 MILLION
	PROTEROZOIC and ARCHEOZOIC ERAS
	4 1/2 BILLION



HAGERMAN FOSSIL BEDS

INTRODUCTION

This chapter contains detailed information about paleontological resources in the monument, as well as an overview of the monument's other natural resources and cultural resources. A more complete discussion of all the monument's resources can be found in the *Draft General Management Plan / Environmental Impact Statement* (NPS 1995a).

NATURAL RESOURCES

Paleontological Resources

Fossils are the primary source of information about the past life and environments on the earth. They provide a direct link to our planet's natural history and indirect information about climatic change. The goal of the science of paleontology is to transform the mysteries of the fossil record into an accurate history of our planet.

Considering that life has been on this planet for millions of years, scientists would expect the number of fossil species to far outnumber the species alive today. However, the world's fossil record contains only about 250,000 species, whereas scientists estimate that as many as 4,500,000 plant and animal species may be living in the world today (Raup and Stanley 1978). Scientists have concluded that very few plants and animals become fossils and that natural processes such as erosion probably destroy most fossils. Our access to this limited record is further restricted because few areas of sedimentary rock containing fossils are exposed to our view. It readily becomes apparent that for any particular portion of geological time, the available fossil record is extremely small.

Despite these obstacles, there are a few special areas where the odds have been beaten and fossils are preserved and exposed in quality, quantity, and variety that allow insight into a bit of earth's history that is not available elsewhere. Hagerman Fossil Beds National Monument is one of those places: a rich preserve of scientific information for a portion of geological time called the Blancan, which is in the late Pliocene epoch, 3.5 million years ago. (See geologic time scale graphic at the beginning of this section).

The fossil sites in Hagerman Fossil Beds National Monument are globally significant for their quantity, quality, and species diversity. (See figure 1, which shows comparisons of the monument's species diversity to other fossil sites from the Blancan period.) Fossils of vertebrates, invertebrates, and plants are included. This diversity, combined with a stratigraphic record affording excellent dates and sequences, provides outstanding opportunities for research of evolutionary changes in plants and animals and the ecological response of species and their environments to climatic change.

The fossil beds at Hagerman are in fluvial and floodplain deposits along the eastern margin of the Glenns Ferry Formation. More than 550 fossil sites have been documented over an area of 6 square miles at different horizons within these sediments. Many fossil exposures have occurred in areas where the wind has eroded the protective sedimentary cover. But the best-known discovery has been the "horse quarry," which is the largest single deposit of an extinct species of

BLANCAN LOCALITIES SPECIES DIVERSITY

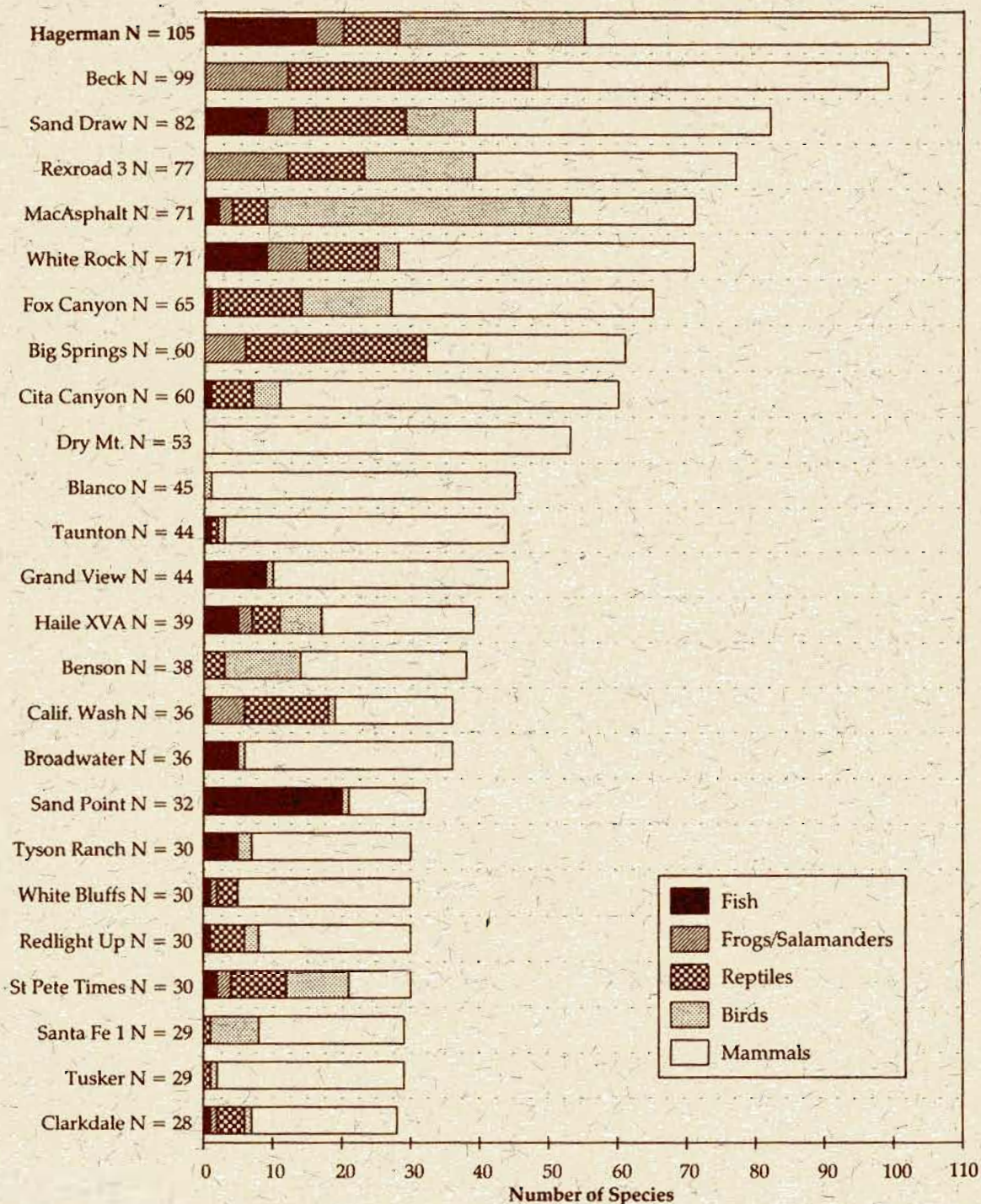


Figure 1: Comparison of Fossils at Hagerman to Other Sites

horse ever found. Also preserved in the sediments is one of the most prolific and diverse deposits of Pliocene animals. More than 100 species of vertebrates, including 16 fishes, 4 amphibians, 8 reptiles, 27 birds, and 50 mammals, have been identified, as well as freshwater snails and clams, plants, and plant pollen.

Of the known fossil areas of Blancan age, none approaches the quantity and quality of material at Hagerman (see figure 1). Many national park system areas preserve fossil resources from throughout the Tertiary period, but Hagerman Fossil Beds National Monument is the only unit in the national park system that preserves fossils representative of the late Pliocene. Fossils from the early Pliocene are known from John Day Fossil Beds National Monument in Oregon, and in this respect the fossils at Hagerman represent a continuation of the geological story preserved at John Day. The high concentration of sites at Hagerman within a relatively short geological span of time makes possible the resolution of geological events not possible for most areas.

Largely from the fossil record at Hagerman, we understand the Blancan to be a time when many older or archaic species such as the hyena-like dog *Borophagus* became extinct and when many modern species such as the horse (*Equus*), the deer (*Odocoileus*), and the pocket gopher (*Geomys*) made their first appearance. The fossil record speaks of the immigration of animals known previously from other continents. For example, the Isthmus of Panama provided the first land connection between North America and South America since the age of dinosaurs. It was also at this time that many new species known previously from Eurasia appeared in North America. One of these, *Ursus abstrusus*, the ancestor to the black bear, was first described on the basis of material found at Hagerman Fossil Beds.

The fossils found at the monument appear to be from wetland, riparian, and grassland savanna habitats. Preserved in the sediments of the monument is further evidence for cycles of sedimentation and erosion. These cycles may be related to changes in the size of ancient Lake Idaho to the west, which in turn was responding to long-term changes in rainfall and temperature. The sediments also preserve evidence of volcanic activity, both local and as far away as the Cascade and Yellowstone regions.

At the monument today we find riparian habitats along the Snake River, but the rest of the region is primarily high desert scrub. This is in marked contrast to the ecosystem preserved in the sediments of the monument. This older ecosystem existed at a time of greater rainfall, almost twice as much as southern Idaho receives today. This resulted in extensive riparian and wetland habitat teeming with waterfowl, frogs, turtles, and aquatic mammals such as muskrat, beaver, and otter. The rich grassland savanna supported herds of zebra-like horses, camels, llamas, peccaries, and mastodons, a scene resembling the rich savannas of eastern Africa today.

Our understanding of this ancient ecosystem and how it changed over 500,000 years is based on the wealth of information in the Hagerman Fossil Beds. Besides the bones of large animals, the monument contains areas with high concentrations of the bones of small animals. The latter often are overlooked by the general public, but they actually provide the bulk of information by which we can reconstruct these ancient ecosystems. For example, along with the bones preserved in the sands of ancient river courses are the shells of snails and freshwater clams, many of which have close living relatives whose ecology is known. Our knowledge of the animals is complemented by the presence of pollen in the sediments, which provides direct evidence of the plants living in this ecosystem.

Although our knowledge of the ancient vegetation in the Hagerman Fossil Beds area was limited in the past to the pollen record, this information was augmented recently by the discovery of a log with some of its original unfossilized wood fibers still intact. This exciting discovery opens numerous opportunities for understanding the paleoecology of the region as scientists using modern technology make comparisons of the log with its modern relatives.

Another new discovery for the monument is a complete skull of the extinct camel, *Camelops*, in the Tuana Gravels. These gravels are younger than the Glenns Ferry Formation, which contained all the fossils previously found in the monument. The Tuana Gravels represent the time following the draining of Lake Idaho and a major change in the ecosystem of southern Idaho. Our knowledge of this new ecosystem has been scant because of the absence of a fossil record. The discovery of the camel skull provides the first bit of information about this ecosystem and indicates new opportunities for research at the monument.

Also present in the monument are carbonaceous paper shales representing pond deposits with high amounts of plant debris. No studies of these shales have been done with regard to the macrobotanical material. The study of plants from these deposits should yield important information on the vegetation associated with pond environments. These shales also have the potential to contain insects.

Providing a Center for Paleontological Research. The legislated purpose of Hagerman Fossil Beds National Monument, "to provide a center for continuing paleontological research," provides a unique responsibility and opportunity for the National Park Service and this *General Management Plan*. Approximately 100 units in the national park system have paleontological resources, but only nine units, including Hagerman Fossil Beds, were added to the system primarily for their paleontological resources. Petrified Forest National Park is another of the nine units, and its 1992 *General Management Plan* calls for development of a paleontological research center at Petrified Forest. However, that planning decision was not the result of an explicit legislative mandate, and the fossils at Petrified Forest are from an entirely different time period than those at Hagerman. Hagerman Fossil Beds is the only unit in the national park system with legislative direction to be "a center for paleontological research," which requires Hagerman Fossil Beds to be quite different from the other national park system units without such a mandate.

Only three existing facilities in the United States approach a similar research mandate or are located in context with their primary resources: the Page Museum at the La Brea Tar Pits in California, the Paleontological Research Institute at Cornell University in New York, and the Mammoth Site in Hot Springs, South Dakota. However, in addition to the capabilities of these facilities, Hagerman Fossil Beds National Monument has the potential onsite for extensive field-based and collections-based research. It also has the mandate to justify onsite staff who can perform necessary research functions and facilitate the research of others. Its legislative mandate and location place the monument in a good position to provide services to other units of the national park system with paleontological resources and to serve as a center for paleontological research regarding the late Pliocene epoch of the earth's history.

The following are the advantages of locating a research center in direct association with its resource base:

The opportunity to interpret the resources and the science of paleontology to visitors and educational groups in context with the environment where the resources were found.

Fewer constraints, simplified logistics, and increased efficiency. This will allow researchers to explore broader research questions in more depth, providing more information per unit of time. More time and care can be given to data collection, which will make the data more valuable in the future.

An opportunity for the resources to remain together in one place. This will facilitate an integrated, multidisciplinary approach in which scientists from different disciplines can work together on the same resources. This could facilitate such matters as understanding ecological relationships and environmental changes through time.

The mandate to be a center for paleontological research provides Hagerman Fossil Beds with an opportunity, and perhaps an obligation, to play a pivotal and vital role in the science of paleontology, not only in the United States, but also internationally. The fossil resources at Hagerman are international in character and reputation. They have great potential to contribute to research and resource management being conducted around the world. To meet the research mandate, Hagerman Fossil Beds National Monument must have the flexibility to accommodate new approaches and procedures in the science.

Resource Considerations and Visitor Opportunities. The nature of paleontological resources is that they must remain underground or be properly stored in a museum collection. When exposed on the surface, they must be systematically collected and removed to protect them and their scientific value from deterioration by natural forces or damage by people. Most of the monument consists of steep cliffs of highly erodible sandy soils with little vegetation. This makes the monument's fossil resources even more vulnerable to exposure and destruction.

Fossils are virtually everywhere in the steeper sections of the monument, and many of them are very fragile. Exposed fossils must be properly documented, removed, prepared, identified, and stored with their data in a collection to ensure their preservation for future generations of both scientists and the general public. The nature of the paleontological resources at Hagerman dictates that the National Park Service cannot allow them to remain exposed on the surface. Specimens carelessly moved or removed without careful documentation of their geological context in the field lose much of their scientific value.

Unlike other natural resources (a herd of elk or a waterfall, for example), fossil resources are not easily presented to the public in a natural setting. If one has a close encounter with a fossil in the field without the benefit of direct interpretive services and support, the visitor experience is most often trivial. If a visitor drives through Yellowstone and never talks to a park ranger or reads any of the handout materials prepared by the National Park Service, he or she still cannot escape some level of personal experience. Most visitors cannot view a Civil War battlefield without some vague emotion shuddering through their bodies. But in most cases it is possible to visit a rich paleontological site such as Hagerman Fossil Beds without ever recognizing the area as such or, for that matter, even recognizing most fossil specimens. Without expert assistance, most visitors cannot begin to identify what type of fossil they may be viewing or comprehend its significance, scientific value, geologic context, or ecological relationships. Because these are absolutely essential components of fossil resources, interpretation will be especially important at Hagerman Fossil Beds National Monument.

Paleontology as a science is and will remain dependent on the proper collection, documentation, and curation of fossil material. Collections are as much a resource as the fossils in the ground or

on the surface. The preservation and curation of specimens and their associated data is important for future research because the scientific method requires independent verification of the observations and interpretations of researchers. In paleontology, this verification is possible only when other researchers have access to the original specimens on which a particular piece of research is based.

Overview of Other Natural Resources

Hagerman Valley is in the central Snake River Plain region of the eastern portion of the Columbia Plateau physiographic province. The Snake River, which flows west, then north, through this valley, forms the eastern boundary of the monument. On the monument side of the Snake River, the valley wall rises steeply and abruptly about 550 feet above the river. Much of this steep terrain forms badlands-type topography characterized by bluffs, landslide scarps, and hummocky deposits. The bluffs are composed primarily of poorly consolidated lake, floodplain, and stream deposits, volcanic ash, and thin basalt flows that extend farther to the west.

Wildlife and vegetation in the monument tend to be typical of the intermountain region and its high desert scrub and sagebrush communities. The Snake River provides habitat for migrating waterfowl, riparian vegetation, and fish species.

Four federally listed threatened or endangered animals may occur in the monument: the bald eagle (*Haliaeetus leucocephalus*) and three species of freshwater snails, the desert valvata (*Valvata utahensis*), the Snake River Physa (*Physa natricaria*), and the Bliss Rapids snail (*Taylorconcha serpenticola*). Surveys for endangered and threatened animals have not been conducted in the monument.

No threatened or endangered plant species are known to be in or adjacent to the monument.

There are many drainages in the monument, but there are no perennial streams other than the Snake River. Two washes dominate the bluffs. One is Fossil Gulch, which cuts through important fossil beds. Natural drainage in the Fossil Gulch area is altered by the pump access road and pipeline. The second, larger wash is Peters Gulch, an intermittent stream at the southeast corner of the monument, which also dissects several fossil beds before entering the river.

Land west of the boundary is predominantly irrigated cropland. Water from the Fossil Gulch pump station is pumped through pipelines to these agricultural uplands.

The 1974 *Draft Environmental Statement* for the proposed monument stated that there were no seeps along the bluffs on the monument side of the river. These perched aquifers followed the development of farmlands on the plateau and the construction of two irrigation canals supplied with water pumped from the Snake River to the canyon rim (Moffat and Jones 1984; Young 1984).

Variations in the sediments in the Glens Ferry Formation indicate that there are several perched aquifers. Buried stream deposits in this formation and local basalt flows function as aquifers interspersed with the more impermeable floodplain facies. Water movement is facilitated by coarser river sands, which tend to be more permeable. Water is funneled to the sands by the more impermeable overbank deposits of silts and clays. The canals penetrate the rela-

tively impermeable caliche layer, allowing seepage from the canals to recharge the shallow perched aquifer. Since 1983 five large landslides have occurred within the present boundaries of the monument, one of which destroyed the pumping station in the Peters Gulch area. Subsequent cliff failures continue at an alarming rate. In 1995 the entire ridge failed between the areas of the 1983 and 1987 landslides. Future landslides continue to be a serious threat not only to the paleontological resources of the monument but to human safety and property.

The natural ambient sound environment of the monument is extremely quiet due to its rural setting, its general lack of trees, and its sparse sagebrush/grassland vegetation.

OVERVIEW OF CULTURAL RESOURCES

Prehistoric and historic archeological sites have been found in and near Hagerman Fossil Beds National Monument. The geological and biological diversity of the Hagerman area provided resources for early human subsistence. Human occupation may have occurred as early as 15,000 years ago, before the Bonneville Flood, with direct evidence at 10,000 years ago. Various sequences of cultural adaptations to changing environments have continued to occur, as have diverse patterns of living by different groups over time.

The area contains Paleo-Indian artifactual remains and other traces of prehistoric and historic Native American cultures. Consultations with contemporary Native Americans indicate that in historic times Bannock, Shoshone, and Paiute peoples frequented the area, including what is now the monument. Native American neighbors consider the monument area regionally important and worthy of interpretation for its historic fishing significance and the cultural values important to the contemporary Shoshone-Bannock Tribes of the Fort Hall Reservation and the Shoshone-Paiute Tribes of the Duck Valley Reservation.

Of major historical importance is the 1840s Oregon Trail, which traverses the monument and reflects the activities of pioneer emigrants and local Native Americans who traded with them on their way west.

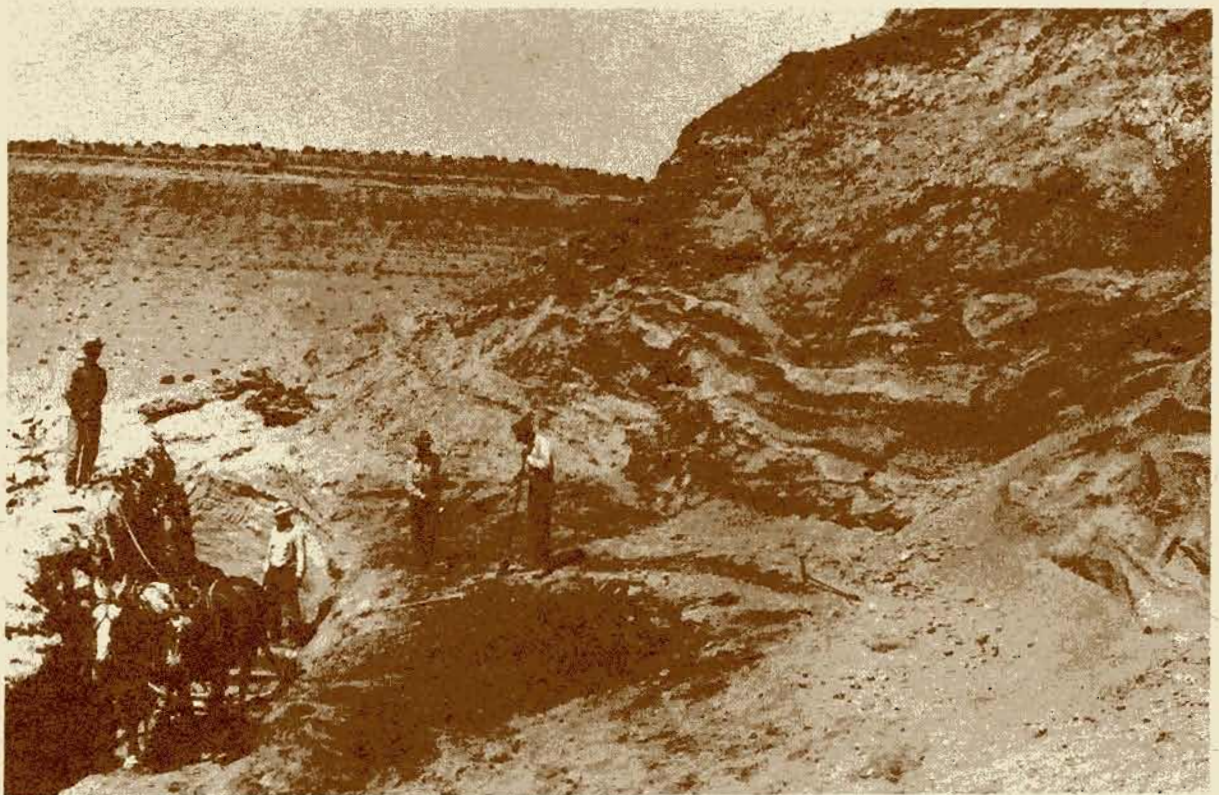
The research center and museum site contains historic structures and other evidence of Euro-American farming, mining, and irrigation activities. The monument proper contains not only artifactual remnants of early 20th century ranching but also excavation sites from the 1920s and 1930s, which are of great relevance to the history of the science of paleontology.

Elmer Cook, a rancher who was running cattle in what is now the monument, showed some fossil bones to Harold T. Stearns of the United States Geological Survey in 1928. Stearns in turn passed the fossils on to James W. Gidley of the Smithsonian Institution. During the summer of 1929 the two scientists excavated what became known as the Hagerman Horse Quarry. Three tons of specimens were sent back to the Smithsonian Institution in Washington.

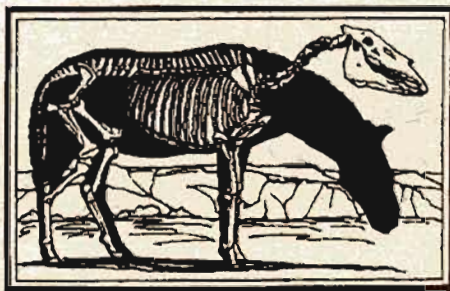
Additional excavations were conducted in 1930, 1931, and 1934. "What the Smithsonian had discovered was the largest single sample ever found of an extinct species of horse. In addition to the horse, there were several other animals, including beaver, otter, mastodon, peccary, a primitive muskrat, frog, rabbit, turtle, birds, and fish. The remains of many of these animals were found not only in [the Hagerman] Horse quarry, but also in sediments of the surrounding bluffs" (McDonald 1993).

In the 1950s and 1960s Claude W. Hibbard led a renewal of scientific interest in the fossil beds at Hagerman, with emphasis this time on "what was usually the ignored part of the fauna — the rodents and other small animals. Hibbard and his students literally crawled over the exposures at Hagerman on their hands and knees looking for mice teeth, jaws, and bones. As in the [Hagerman] Horse quarry, the search produced a phenomenal abundance of specimens" (McDonald 1993).

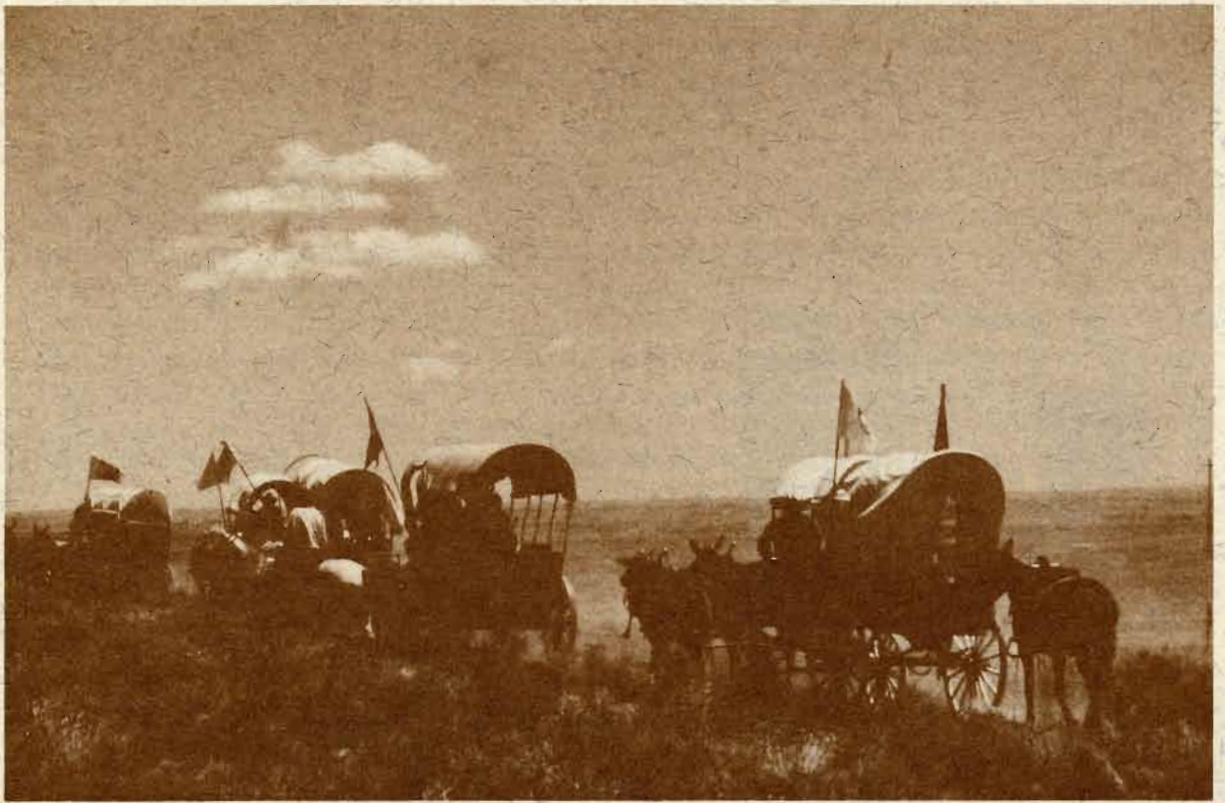
More recent scientific expeditions in the area that is now the monument include those conducted in 1966 by the Los Angeles County Museum of Natural History and in 1967 by the Idaho State University Museum (now the Idaho Museum of Natural History). These expeditions collected significant numbers of fossil specimens for statistical study, comparison, and display. Since the establishment of the monument, NPS personnel have worked with Idaho State University under a cooperative agreement to locate and collect fossils uncovered by erosion. Fossils uncovered to date include a tree trunk 3 million years old and a camel skull 2 million years old, collected in 1994. Each of these appears to contain substantial amounts of unfossilized organic material. These seem to be unique and scientifically spectacular discoveries.



1934 Hagerman Horse Quarry Excavation



Cost Estimates / Planning Team /
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Oregon Trail Reenactment

ESTIMATES OF CONSTRUCTION COSTS AND STAFFING

Cost Estimates

The construction cost estimates shown in table 1 include gross construction costs and advance and project planning costs. Gross construction costs are the estimated cost of actually constructing the facilities. Advance and project planning costs cover comprehensive design of the facilities, any survey or other data-gathering needs, and site-specific environmental compliance — all the preparatory work needed to get from the conceptual general management plan stage to the construction stage.

It is important to understand that the cost estimates are based on many assumptions at this stage of planning. Therefore, the actual costs may differ substantially after more information is gathered and detailed designs are prepared. Every effort will be made to reduce costs consistent with achieving the plan's goals for the function of each facility and for the long-term sustainability and cost-effectiveness of each facility.

The estimates represent the best professional judgment of the National Park Service, based on our experience with similar facilities locally and nationwide and our level of information about the proposed facilities. However, the estimates are based on standard design and construction practices of the federal government, some of which may be changing. For example, the National Park Service will not expect to build all the facilities from congressional appropriations. Some combination of private and public funds will be needed to implement this plan. The National Park Service cannot present estimated construction costs from the private sector in its planning documents. To achieve consistency in its cost estimates to Congress, the Park Service uses only approved government estimating tables. When all the variables are considered, it is probable that many private sector estimates will be less for particular construction proposals; however, the brief period that those estimates remain viable in the competitive private sector prohibits their use for long-term planning. It is also impossible to predict how much of the facility proposals will be privately funded.

It is unknown whether the farm buildings on the research center and museum site can be adaptively reused and, if so, how much work it would involve. For that reason it is impossible to estimate costs adequately, and they have not been included.

Phasing

Phasing is possible for part of the plan, as shown following table 1. Phasing will allow viable smaller parts of the plan to be funded separately so that they can stand alone in case funding for other parts of the plan is not available within a given timeframe. It also will permit logical scheduling, because parts of the project need to be designed and built before other parts. For example, the need for the research center part of the research center and museum facility is immediate because approximately 2,000 fossil specimens must be collected every year as they sur-

face due to erosion in the monument. The museum and other visitor parts of the facility should be built only after issues regarding road access to the site are resolved.

There is no particular advantage to phasing the facilities not associated directly with the research center and museum. They can be built at any time in any sequence as opportunities to fund or otherwise build the facilities present themselves.

TABLE 1: GROSS CONSTRUCTION ESTIMATES

Facility	Estimated Cost		
	Gross Construction	Advance and Project Planning	Total
<u>Research Center and Museum</u>			
Building	\$2,450,000	\$465,000	\$2,915,500
Furnishings and equipment	822,020	156,860	978,880
Museum exhibits	1,135,800	283,950	1,419,750
Viewing decks/patios	121,500	23,170	144,670
Site Utilities			
Electricity and telephone	45,500	8,700	54,200
Water, Wastewater ¹	1,527,500	291,500	1,819,000
Site work (bridge, landscaping, parking, picnic sites, trails, roads, signs)	1,708,150	325,000	2,033,150
Maintenance facility (shop building, office, yard area, fire cache, storage)	331,600	63,300	394,900
<u>Oregon Trail Overlook</u>			
Upgrade to paved, vault toilet, fence (20 cars; 2 buses or RVs)	\$ 65,000	\$ 12,400	\$ 77,400
<u>Snake River Overlook</u>			
Upgrade to paved, fence (15 cars)	\$ 16,900	\$ 3,200	\$ 20,100
<u>Hagerman Horse Quarry Overlook</u>			
New gravel-surfaced parking area (10 cars; 2 buses or RVs), fence, gates	\$ 17,250	\$ 3,300	\$ 20,550
<u>Bluff Trail and Emigrant Trail</u>			
Trail 4 feet wide x 5.6 miles long; natural surface	\$ 58,700	\$ 11,200	\$ 69,900
<u>Rim-to-River Trail</u>			
Trail 2.75 miles long; natural surface	\$ 28,800	\$ 5,500	\$ 34,300
<u>Boat Dock</u>			
Floating dock adjacent to site	\$ 9,170	\$ 830	\$ 10,000

NOTE: The above estimates are based on fiscal year 1996 construction. For future years, the estimates should be increased by 4% each year.

1. In estimates for water and wastewater it is assumed that connections will be made to existing municipal systems and that the National Park Service will bear all the costs for the necessary pipelines. It is likely that some of the pipeline costs will be shared with other users who will connect to it, but it is impossible to estimate in advance how much of this will occur and how much it will reduce the costs.

PHASES**Phase 1: Major Site Infrastructure and Research Center**

Utilities infrastructure	\$1,873,200	
Roads, research parking, bridge, landscaping, and signs	1,256,500	
Research center, including furnishings and equipment	<u>2,592,800</u>	
Total, phase 1		\$5,722,500

Phase 2: Visitor Infrastructure and Museum

Roads, visitor parking, landscaping, picnic sites, trails, and signs	\$ 776,650	
Museum, including furnishings, equipment, and decks	1,446,250	
Exhibits	<u>1,419,750</u>	
Total, phase 2		\$3,642,650
Total, Research Center and Museum		\$9,365,150

Other Facilities (not in phases)

Horse Quarry Overlook	\$20,550	
Oregon Trail and Snake River Overlooks	97,500	
Rim-to-River Trail	34,300	
Bluff Trail and Emigrant Trail	69,900	
Maintenance facility	394,900	
Boat dock	<u>10,000</u>	
Total, other facilities		\$ 627,150
Total for Proposed Action		\$9,992,300

Staffing Estimates

Estimates for the staff that will be needed to implement the plan are shown in table 2. Staff estimates are provided for a low to medium visitation scenario and for a high visitation scenario. Positions that may be filled either by the National Park Service or by a cooperating group are noted. In either case, the National Park Service will maintain the responsibility and ability for managing and protecting the monument. These estimates, which represent the best professional judgment of the planning team, are based on experience with past management practices, some of which are changing. Therefore, the estimates are for comparison purposes only; they may change as managers gain experience with the particular set of conditions created by implementation of the plan.

TABLE 2: STAFF ESTIMATES

NOTE: The positions in the shaded lines could be either National Park Service employees or persons associated with a cooperating group.

Position Title	Grade Level	Full-Time Equivalents, Low to Medium Visitation Projections
<u>Permanent</u>		
Superintendent	GS-13/14	1.0
Chief ranger	GS-12	1.0
Park ranger (general)	GS-11	1.0
Park ranger (interpretation)	GS-11	1.0
Resource management specialist	GS-9	1.0
Education specialist	GS-9	1.0
Physical science technician	GS-7	1.0
Paleontologist	research grade	1.0
Paleontologist	research grade	1.0
Museum curator	GS-11	1.0
Museum technician	GS-7	1.0
Laboratory technician	GS-7	1.0
Librarian	GS-7	1.0
Administrative officer	GS-11	1.0
Administrative assistant	GS-7	1.0
Secretary	GS-5	1.0
Secretary	GS-5	1.0
Office automation clerk	GS-4	1.0
Maintenance worker	WG-09	1.0
Maintenance worker	WG-05	1.0
<u>Temporary</u>		
Park ranger (interpretation/resource management)	GS-7	0.75
Park ranger (interpretation)	GS-5	0.75
Park ranger (interpretation)	GS-5	0.75
Park ranger (interpretation)	GS-4	0.5
Park ranger (interpretation)	GS-4	0.5
Park ranger (general)	GS-5	0.75
Park ranger (general)	GS-5	0.75
Museum technician	GS-7	0.5
Museum technician	GS-7	0.5
Maintenance worker	WG-3	1.0
Staffing for the high visitation projection would consist of all of the above, plus the following additional positions.		
Park ranger (interpretation/resource management)	GS-7	0.75
Park ranger (interpretation)	GS-4	0.5
Park ranger (interpretation)	GS-4	0.5
Maintenance worker	WG-3	0.5

PLANNING TEAM AND CONSULTANTS

NATIONAL PARK SERVICE PLANNING TEAM

Hagerman Fossil Beds National Monument

Neil King, Superintendent (1994 to present), Unit Manager (1990-1994)

Dr. Gregory Mc Donald, Paleontologist

Bob Willhite, Chief Ranger

Denver Service Center

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Hagerman Fossil Beds National Monument

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Christopher Force, Museum Technician

Larry Growney, Physical Science Technician

James Ward, Park Ranger

Denver Service Center

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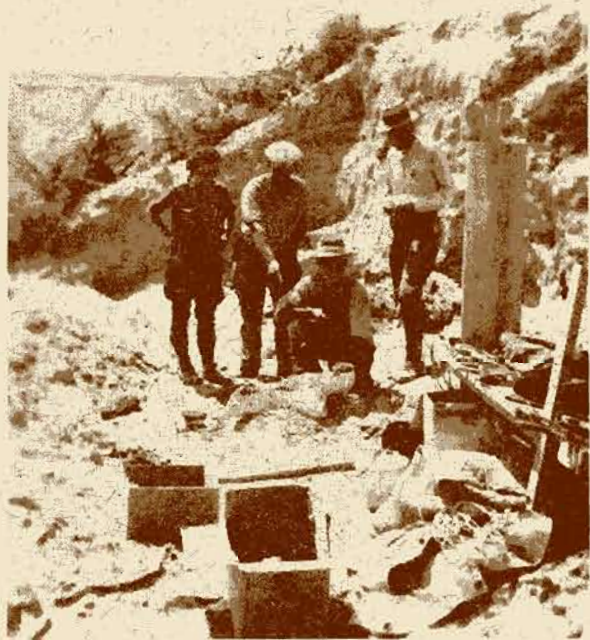
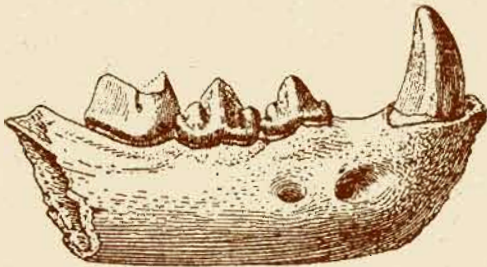
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RECORD OF DECISION

On the following pages is a copy of the record of decision for the *Final General Management Plan and Environmental Impact Statement: Hagerman Fossil Beds National Monument* (GMP/EIS), published in July 1996. The record of decision, which was approved September 18, 1996, documents the decision resulting from the GMP/EIS process. This *General Management Plan* presents in detail the plan that was decided upon in the record of decision.



1934 Smithsonian excavation



UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

RECORD OF DECISION

FINAL GENERAL MANAGEMENT PLAN/ENVIRONMENTAL IMPACT STATEMENT
FOR HAGERMAN FOSSIL BEDS NATIONAL MONUMENT, IDAHO**Introduction:**

Pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended, and the regulations promulgated by the Council on Environmental Quality (40 CFR 1505.2), the Department of the Interior, National Park Service, has prepared this Record of Decision on the Final General Management Plan/Environmental Impact Statement for Hagerman Fossil Beds National Monument in Twin Falls and Gooding Counties, Idaho. The Record of Decision is a concise statement of the decisions made, other alternatives considered, the basis for the decision, the environmentally preferable alternative, the mitigating measures developed to avoid or minimize environmental harm, and public involvement in the decision making process.

The Decision (Selected Action):

The National Park Service will implement the proposed action (Alternative 2) as described in the Final General Management Plan/Environmental Impact Statement (GMP/EIS) issued in July 1996. The Draft GMP/EIS was issued in November 1995.

The selected action (Alternative 2) will provide a plan for comprehensively meeting the monument's legislative mandate to provide a center for paleontological research and education, including the construction of a fully functional research center and museum. The National Park Service will perform professional research, educational, and resource management functions as peers and partners with various persons, institutions, and organizations that will help staff, fund, equip, and implement those functions. An institute will need to be established to help facilitate monument research and educational programs. The research center and museum will be integrated so that visitors will be able to interact with researchers and research projects. Support for educational programs will be a major monument function. In addition to paleontological resources, other monument resources, including the Oregon Trail, will receive the benefit of fully professional resource management, interpretation, and educational programs. An overlook at the Hagerman Horse Quarry, the Bluff and Emigrant Trails and a Rim-to-River Trail will be constructed, along with improvements to the existing Snake River and Oregon Trail overlooks.

Additional actions common to all alternatives in the Draft and Final GMP/EIS are included in the selected action, including: measures to ensure compliance with all applicable laws and policies; participation in regional planning and information/orientation efforts; housing employees outside the monument in the private sector; restricting visitors to designated roads and trails in most areas; prohibiting camping in the monument; and continuing hunting and fishing as legislatively

mandated. Carrying capacity considerations will be addressed primarily by directing visitors to the research center and museum and then encouraging them to stay there or venture into other areas depending upon current visitation and resource conditions.

Statements of the monument's purpose, significance, management goals, desired future conditions, interpretive themes, and management zones are also part of the selected action. In addition, the selected action calls for a number of future action plans as described on pages 16-17 of the Draft GMP/EIS. To implement the plan, implementation teams and partnerships will be set up, and creative funding opportunities and potential cost savings will be fully evaluated and utilized where practicable.

Alternatives Considered:

In addition to the selected action, two other alternatives were fully evaluated in the Draft and Final GMP/EIS: the No-Action Alternative, and a minimum requirements alternative (Alternative 1). The No-Action Alternative would have continued the present course of action with only minor changes from existing conditions, and would not have met the legislative mandate for the monument to provide for paleontological research and education. It would not have provided a research center and museum, and would have allowed only the most fundamental resource stewardship and interpretation activities. Resource management, interpretation and visitor protection activities would have been severely limited and there would have been little or no support for research or educational programs.

Alternative 1 would have met the minimum requirements of the legislative mandate by operating the research center and museum at a limited level, with research and museum functions separated so that research and researchers would generally not have been accessible to visitors. Research and education functions would have been almost entirely dependent on sources outside the National Park Service. A professional paleontological resource management program would have been provided, but programs for the monument's other resources would have been limited. The Snake River and Oregon Trail overlooks would have remained in the present condition, and the Bluff and Emigrant Trails would have been the only new construction in the monument.

Actions Considered But Rejected: In addition to the alternatives which were fully evaluated in the Draft and Final GMP/EIS, the following actions were identified as considered but rejected in the Draft GMP/EIS, with rationale for rejecting the actions detailed on page 50 of that document: public camping or other overnight use in the monument; transit service provided by the National Park Service (however, an action common to all alternatives left open the possibility of future private or public/private transportation services if needed and appropriate); a bridge or gondola across the Snake River to the monument; and improvements to the pump access road or otherwise increasing private vehicle access to the Snake River in the monument.

Environmentally Preferable Alternative:

The selected action (Alternative 2) is considered to be the environmentally preferable alternative.

Measures to Minimize Environmental Harm:

All practicable measures to avoid or minimize environmental impacts that could result from implementation of the selected plan have been identified and incorporated into the selected action. These include, but are not limited to: restricting visitors to designated roads and trails in most areas; revegetation of disturbed sites with native plants; restoration or maintenance of natural processes to the extent practicable; baseline studies of plants and animals; consultation and compliance regarding cultural resources; monitoring programs for resource and visitor impacts and carrying capacities; and emphasis on resource protection in interpretation and educational programs.

Because the general management plan is mostly conceptual in scope, site-specific surveys, consultation, and compliance with all applicable laws, regulations, and policies, including mitigation if necessary, will be carried out before any development begins.

Public Involvement:

Scoping and consultation are detailed in the Draft GMP/EIS on pages 133-135 and 142-154, and in the Final GMP/EIS on pages 106-107. Public scoping began in 1990, and was reinitiated in 1993 after publication of a notice of intent to prepare an environmental impact statement. A separate planning effort to select a site for a research center and museum for the monument resulted in a draft environmental assessment in 1993 and a finding of no significant impact and selection of the proposed site in 1995, as detailed on pages 15 and 133 of the Draft GMP/EIS.

A public review period associated with a scoping newsletter occurred in 1993, and another public review period including public meetings occurred in 1994 to consider draft statements of monument purpose, management goals, and management options. Consultation was also completed with the U.S. Fish and Wildlife Service, the Advisory Council on Historic Preservation, the Idaho State Historic Preservation Office, and Native American tribes.

More than 1,000 copies of the Draft GMP/EIS were distributed between November 1995 and March 1996. Written comments were accepted for 113 days. A total of 60 people participated in public meetings in Hagerman, Twin Falls, and Boise, Idaho to discuss the draft document and a total of 63 comment letters were received. Because of the nature of the comments received on the Draft GMP/EIS, the Final GMP/EIS was prepared in a shortened format in accordance with 40 CFR 1503.4.

The Final GMP/EIS, distributed in July 1996, responded to comments and included copies of the comment letters, clarifying changes to the text of the draft document, and factual corrections. The changes in the final plan (a) clarified important points regarding hunting, road and trail access, and other issues, and (b) deleted services or facilities from the proposed action that could be accomplished through partnerships or by the private sector and therefore would not require federal funds, further reducing costs. The responses to comments also addressed quality of life and other concerns.

The Basis for The Decision:

After carefully evaluating public comments throughout the planning process, including comments on the Draft and Final GMP/EIS, the selected action best accomplishes the monument's legislated purpose to provide a center for continuing paleontological research and education. It balances the statutory mission of the National Park Service to provide long-term protection of monument resources and significance while allowing for appropriate levels of visitor use and appropriate means of visitor enjoyment. The selected action also best accomplishes identified management goals and desired future conditions, with the fewest environmental impacts.

Support for the selected action and monument purpose has been generally widespread and strong, as described in the Final GMP/EIS. No comments or protests were received on the final plan and environmental impact statement during the 30-day no-action period that the document was available to the public.

Conclusion:

The above factors and considerations warrant selecting Alternative 2, identified as the proposed action in the draft document (and as modified in the Final GMP/EIS), as the general management plan for Hagerman Fossil Beds National Monument. The selected action will be implemented as described, and a final document including only the selected action will be printed and made available to aid in implementing the plan.

Recommended: Neil King
Superintendent, Hagerman Fossil Beds National Monument

Date: 09/18/96

Concurred: William C. Walton
Deputy Field Director, Pacific West Area

Date: 9/18/96

Approved: Stanley T. Allinght
Field Director, Pacific West Area

Date: 9/18/96

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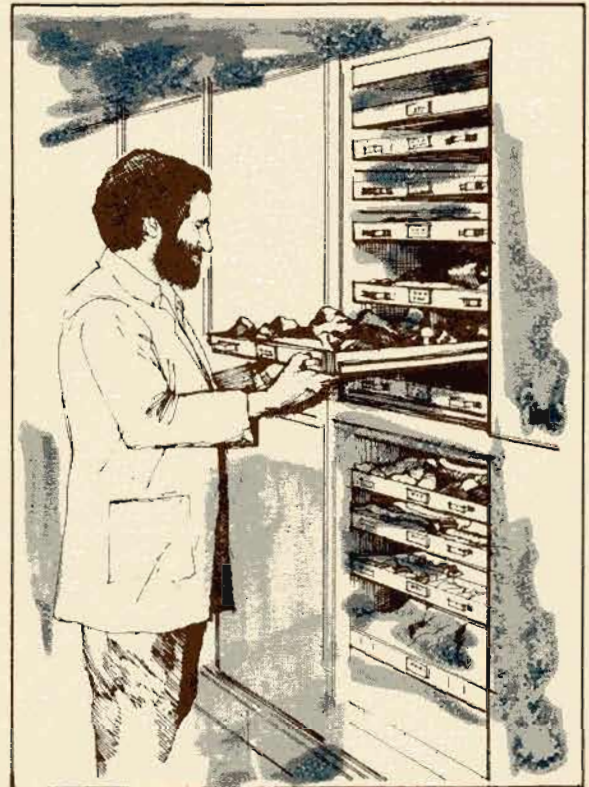
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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources, protecting our fish and wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



United States Department of the Interior /
National Park Service